

# Australian Model Engineering

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Issue 83

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LOCOMOTIVES, TRACTION & STATIONARY ENGINES, BOATS,  
WORKSHOP, PRODUCTS, CLUB NEWS & EVENTS, REVIEWS

In This Issue:  10th Miniature Traction Engine Rally  
 Club Listing for Australia and New Zealand  
 Make Your Own Battery Charger



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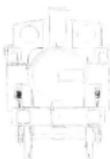
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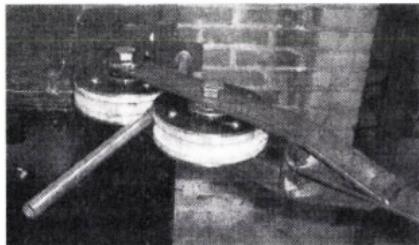
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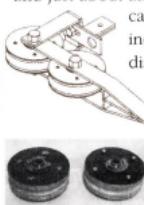
How to build a

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by Vince Gingery

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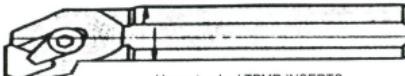
*David Watkins from Mudgee drives his 4" scale Foden and its road train around the railway yards in Canberra. This is just one of the scenes from the 10th Miniature Traction Engine Rally. For more pictures and a full report, turn to page 22.*

Photo: David Proctor

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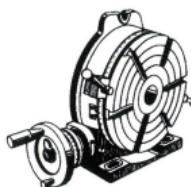
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## Comment

### Can we still afford it?

Not so long ago the AMBSC Boiler codes were (sort of) accepted by most state authorities and there was a fairly respected arrangement for the acceptance of miniature boilers one way or another. The various state authorities had their little idiosyncrasies and the AMBSC officials and individual boiler builders by and large were able to overcome these little obstacles.

The way we operated miniature trains was fairly informal and we had exemptions from the states' (commercial) amusement devices legislation. There were a minimum of rules, usually specific to each track site and the system seemed to work well. In the late 1980's the AALS issued a little booklet entitled *Safety and Operating Code for Miniature Railways*. This was mainly aimed at promoting track and wheel standards Australia wide. This and the boiler codes allowed us to run our equipment anywhere in Australia and mix our rolling stock with that of our interstate friends. No change of gauge at Albury (with wheels and couplings) for us — we were smarter than that!

But as society generally becomes less responsible and more litigious, the authorities and insurers want the hobby to prove to them that they could operate their equipment safely in public. This was not much of a problem for the AMBSC, as the documentation in the boiler codes has been progressively beefed up and expanded (and re-written) as the needs were recognised. However, this was not so for the operating side of the public carrying railways. AALS officials perceived (from the insurance industry) that the safety aspects of the operating code needed to be of a more formal/procedural documentation. This has resulted in a much expanded and re-written operating code, which is now a comprehensive rule book for the operation of our miniature railways and traction engines.

Not only that, the authorities and insurers want all the operators to be formally trained and be issued with "licenses" for individual areas of operation. This has led the AALS to issue another rulebook for the *Training of Operators*, in an effort to comply with the new requirements. Most councils (on whose grounds we mostly operate) were not happy with our \$2 million insurance cover, they wanted at least \$5 million insurance cover. Now (1998), most state Workcover authorities insist we take out \$10 million insurance cover. This has really put a financial burden of many of the smaller clubs as the premiums have increased accordingly. What with stricter Boiler Codes, Operating Codes, Insurance compliances, registrations of equipment, ever thicker rulebooks/codebooks, higher club fees due to higher insurance costs, affiliation fees and having to be even more vigilant on running days, it makes one wonder where it will all end.

Let us hope it is not by reduced public running and displays, with the resultant reduced exposure of our hobby to the public in general.

Neil Graham

## Join us in a great hobby!

If this is your first issue of *Australian Model Engineering*, welcome!

In successive issues we cover many topics centred on that wonderful process of model engineering — alias *tinkering*.

If you're new to model engineering as well as to our magazine, you'll benefit from getting together with other model engineers — we're good at sharing ideas and saving each other money! If you don't have any contacts, start by looking in Club Round-up to find a club that's near to you. Many of our readers have discovered people with similar interests literally just around the corner.

*Helping other model engineers* is the simple idea of the volunteers behind this magazine. Our readers write items for us — for the same (non-existent) rate of pay! If you have ideas, opinions or techniques that you feel would be interesting to others (especially from the newcomer's angle), please drop us a line. We can send you a useful guide and help with preparing artwork or editing.

I hope you'll enjoy the great fellowship that makes our hobby special, and that you'll support our advertisers — after all, they help pay our bills!

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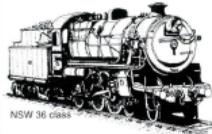
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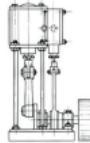
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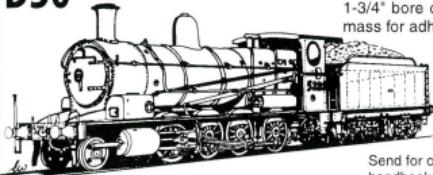
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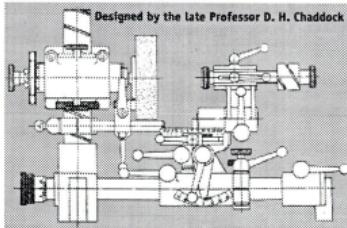


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# Fibreglass Diesel Locomotive Cabs

by Greg Lawrence and Hugh O'Dempsey

Photos by Hugh O'Dempsey



*By following the easy steps in this article, you too will be able to build a fibreglass body for your locomotive*

Well, everyone is out there playing with trains, having a great time. All except you that is. Boy, if only you could get onto those rails too! Trouble is, the loco you want to model is beyond your panel-beating experience or capabilities. Right? Wrong!!

The following article will provide you with an easy to follow guide on how you can build a loco cab, or a whole body for that matter, which will look great, be inexpensive, and stand up to the rigours of time about as well as any other material.

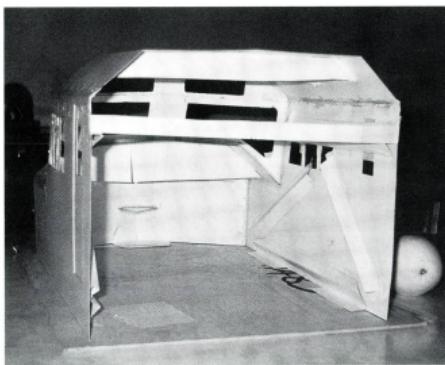
Assuming you have decided on your prototype, motive power and ancillary details, your next ambition is to make it look as close to the real thing as you possibly can. This involves exercising some patience as you work through the following steps, and may take from a few days to several weeks of your spare time to achieve your desired finish. The good news to start with is that you won't need a bank loan to do it — in fact when you look at the list of materials, you will see that around \$40 will see you through.

## Materials

- A couple of sheets of 1.0 mm thick card-board
- A roll of masking tape
- Five minute Araldite®
- Gelcoat®
- Fibreglass matt and resin
- A scrap piece of particle board
- Some general purpose undercoat
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- Wet and dry abrasive sheet
- Paint and lettering to suit



*The former is at the masking tape stage. The orange, the watch and the cassette not part of it!*



Inside view of the former showing bracing prior to the application of the resin coat. Make sure you have enough bracing to keep it really stiff.

## Protective equipment

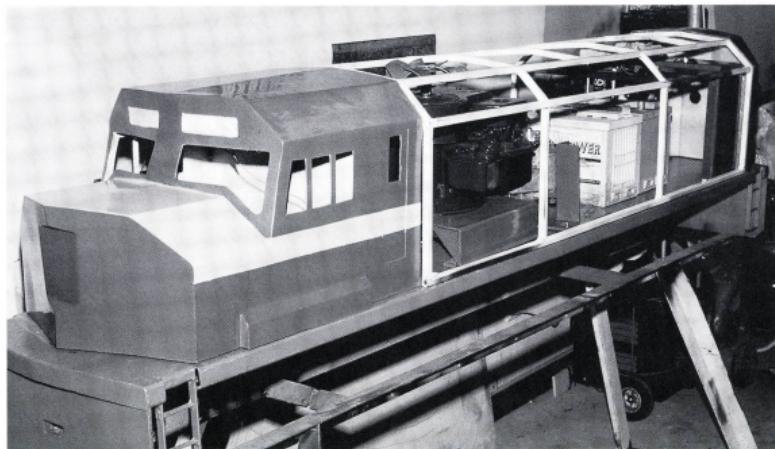
- Dust mask (For use when dry sanding and cutting fibreglass).
- Helmet (For when the spouse beats you for using the dining room table)

## Procedure

First obtain dimensions and photographs of your chosen prototype. Once armed with this information, reduced to scale, build a cardboard mock up of your chosen cab, using 1.0 mm white cardboard sheet purchased from the newsagent and a roll of masking tape.

Cut the cardboard to the required shapes. What you will be trying to achieve is the exact finished article in white card-

*The base coat has been applied and the former is lined up for a trial fit to the remainder of the body, the complete assembly sitting in place on the loco's frame. This view already starts to give an impression of what the finished loco will look like.*



board. In fact, the cardboard will be *staying* inside the finished fibreglass job. This may take several attempts to get right. Tape together, on the *outside* of the cab. Make a former or frame work (particle board is OK) of the cab profile for later use. Once the cab is to the desired size and shape, permanently join the cardboard together on the inside, with a fillet of five minute Araldite. When the Araldite is fully set, preferably overnight, peel off all the masking tape.

### CAUTION: Make sure that you pull the tape back on its self.

If you pull anywhere near right angles you may lift the top gloss surface from the cardboard. Then it becomes a real problem to fix the resulting rough patch at the painting stage.

## Preparing for the fibreglass

Using a couple of drawing pins, temporarily secure the "former" into the embryo cab. This will help stop sag when you apply the Gelcoat, as the cardboard will be damp and soft for a short time. Apply Gelcoat to the outside of the cab, one surface at a time and allow to harden. Repeat until you have coated all exterior surfaces, remove pins as necessary and

then allow to fully harden. Check for imperfections on surfaces and joints, correct and apply a second Gelcoat.

Once hard, apply fibreglass matt and resin to the inside, making sure that full lamination of the matt occurs. Mould in any mounting lugs that you may require at this point and allow to fully harden.

## Surface preparation

With the cab fully hard, use a dust mask and lightly sand the surfaces, to maintain the correct profile and surface finish. Do not sand through the Gelcoat however and disturb the cardboard surface.

Apply a general purpose undercoat to the cab exterior (Auto spraying enamel is quite successful) and when dry, sand again and if necessary, fill any imperfections. The final surface finish depends on how well you have prepared the surface.

## Windows and doors

Mark and cut out the window and door apertures using a variable speed jigsaw and a fine blade. At this point you can also mark and drill the position of head and marker lights.

Another way is to carefully monitor the curing of the matting. When firm but not hard, window openings may be cut with a sharp Stanley knife (cutting from the inside out). When the matting is fully cured file and sand all the edges.

## Painting

Once you are happy with the basic cab, paint to the desired colour scheme. Window glazing can be added using perspex shaped to fit and held in with Araldite. Apply numbering and lettering to suit. Fit details such as door handles, handrails, window wipers, horns, lights etc. Fit the cab to the locomotive frame. Looks pretty doesn't it.

We are sure that you will be pleased with the result, and receive many admiring comments, as we have. Do not hesitate to share your methods with others, and help the hobby along. Happy modelling.

See you on the rails!

# Drilling Round Material

by the late Walter Shellshear

Drawings for publication by Peter Hall

One of the most frustrating jobs I know is the drilling of a hole square through the side of a piece of round material. I struck this problem when drilling through the sides of the round bodies for the cylinder cocks for *Climax*.

To give a better understanding of the project in hand, the cylinder cock body is shown in **Figure 1**. To add to the difficulty, the body is only 0.2" in diameter, the hole for the cylinder cock  $3/32$ " dia., and the total length of the parallel part of the body only 0.22" long.

So how do we ensure that the  $3/32$ " hole goes straight through the middle and doesn't wander off to one side? I decided to follow Mike Wilmot's time-honoured practice when confronted with knotty problems — I sat down and thought about it for a couple of hours and came up with the following solution. I don't claim any originality for this — maybe hundreds of people have thought of it before me.

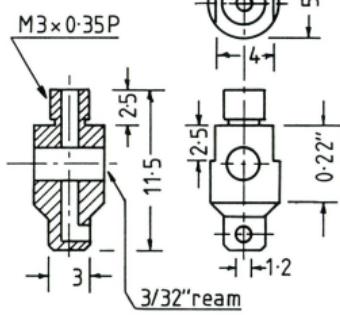
First of all I needed a centre pop in the middle of the 0.22" length, and not just anywhere either — first of all I screwed the body into the cylinder and when up tight, scratched a line down the body on the extreme outside edge. This was to ensure the cylinder cock, when inserted in the body, would be truly at right angles to the engine frame. The body was then

unscrewed from the end of the cylinder and I put a centre pop half way down the 0.22" length and on the line I had just scratched.

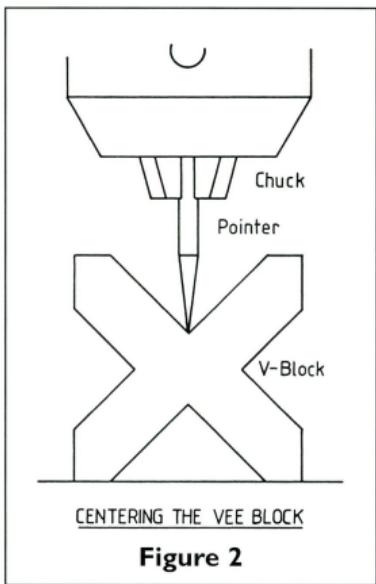
Now for the drilling of the  $3/32$ " hole. First I took a V block and clamped it in the drill press vice. Next I unscrewed the needle from my scriber — this was 0.99" dia., about  $1\frac{1}{4}$ " and with a fairly sharp tapered point. I first put it in a self-centring chuck and gave it a spin to ensure that the point didn't wobble out of centre with the parallel body of the needle.

Next, the needle was clamped in the Jacobs chuck of the drill press and the machine vice moved around until the needle point, when brought down, came exactly in the centre of the angle of the groove in the V block. (**Figure 2**). The point should also touch down about half way along the length of the groove.

The machine vice was then clamped down to the drill press table. When clamped down, the needle point was again brought down to check that it still came into the centre of the angle of the groove in the V block. The needle point was then removed and replaced with a small drill — I used a No. 55 drill. I then placed the brass cylinder cock body in the groove of the V block, started the drill going at a fairly fast speed and brought it down to the job. The brass body was then manoeuvred by hand until the centre pop was directly under the drill point. The brass cock body is not clamped to the V block and if the centre pop is not exactly under the point of the drill, the drill point will move it over into the exact position as you bring the drill down. This is why I used a very



**Figure 1**  
CYLINDER COCK BODY  
phosphor bronze



**Figure 2**

small drill to start with!

If you decide to use this method don't drill right through or you will damage the walls of the V block. So just stop when you feel the drill should be about ready to break through, lift the drill and slip a piece of  $1/2$ " x  $1/2$ " x  $1/16$ " brass angle, about 2" long, under the job. (Extruded or machined but not bent-over angle). Then you can bring the drill down and drill right through that last bit without damaging the V block.

So there was the cylinder cock body with a very small hole dead through the centre and the next problem was how to get the hole up to the  $3/32$ " required dia. I overcame this by opening up the No. 55 hole with a series of taper pin reamers until I got to a size that the slight taper lead at the start of the  $3/32$ " reamer would just enter.

I should explain that the cylinder cock bodies have a parallel hole through them in *Climax* although taper cylinder cocks are the norm. The *Climax* type are much easier to make.

It seems to me that this would be a pretty satisfactory way of drilling the holes through the handrail knobs that our suppliers very inconveniently leave undrilled.

### DRILLING THOSE HANDRAIL KNOBS.

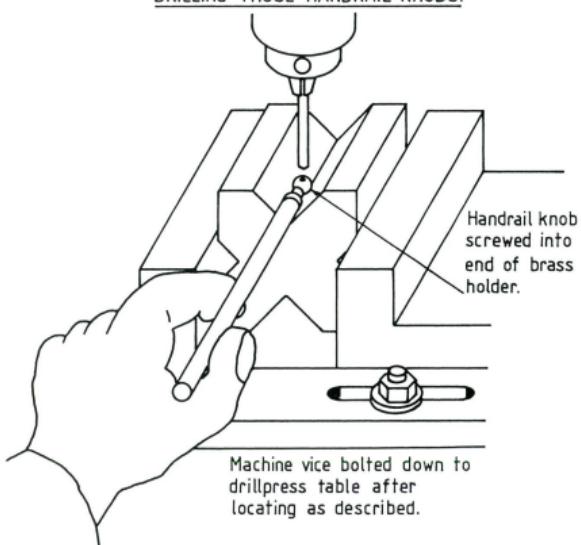


Figure 4

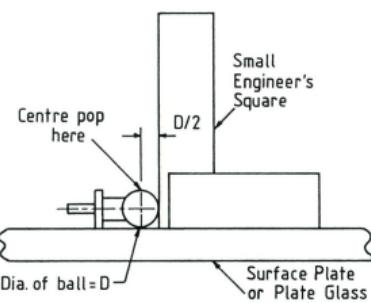
It will be found that the diameter of the flange is mostly the same diameter as the ball of the handrail knob — only problem is to get the centre pop in the right spot to start. Find the spot as shown in **Figure 3**.

Next, take a short length (say about 2" long) of brass rod, same diameter as the ball (D) and tap one end to take the thread on the handrail knob. This will facilitate handling the knob in the V block — set up as for the cylinder cocks with a No. 55 drill in the drill chuck, but don't hold too tight-

ly, let the point of the drill centre itself in the centre pop — then it will go straight through the centre. (**Figure 4**)

When nearly right through, slip the bit of  $1/2'' \times 1/2'' \times 1/16''$  brass angle into the V groove to protect the V block as before.

Again, you have to bring the No. 55 drill hole up to the required size of the handrail with the aid of taper pin reamers — the slight taper of the pin reamers does not matter with handrail knobs — just open out until the handrail can be pushed through



METHOD OF MARKING BALL

Figure 3

(This article originally appeared in the CSMEE's newsletter Canberra Branchline, the forerunner to AME.)

Walter Shellshear was a regular contributor to that publication and to AME when it was established. Most of his articles are just as valid today, and will be published from time to time ...Ed.)

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# Steam Chest



with **Dave Harper**

**H**i there, steam fans, and welcome to another selection of steammobilia. I always enjoy receiving letters from our readers, but it is especially pleasing when a letter arrives from overseas. The letter in question was from Mike Thurgood of Milnerton, South Africa, although he admits to originally hailing from the North of England.

Mike was interested in the photo of the twin cylinder mill engine with Walschaerts valve gear built by Maurie Turner. Mike says: "I constructed a single cylinder free-lance mill engine with this gear way back in the 70s when I lived up in Ulverston, Cumbria, England. I was a bit of an amateur in those days at free-

lancing, and during 1997 I incorporated some improvements. But as it has a brass cylinder and silver steel piston rings, it deliberately does not often get run on steam! But it really does run extremely well.

It is relatively small, with a bore of about 16mm — without dismantling it I can give no exact dimension. I constructed it purely because I wanted to find out how the Walschaerts gear worked, and I hadn't the time to construct a loco, with family commitments."

The engine base apparently came from a very old toy steam plant of his father's, the rest of which has long ago disappeared! To give an idea of the overall size, the base is about 230mm long. **Photos 1** and **2** show this unusual engine. Mike continues:

"It does have a totally unique feature: because I didn't want any overhang

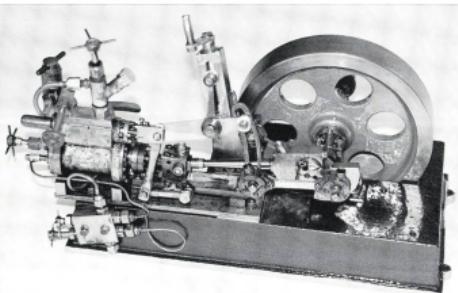
of the cylinder block past the edge of the engine platform, I set the plane of the Walschaerts gear at an acute angle of about 18 degrees to the vertical axis of the engine. Therefore the eccentric rod from the return crank, to accommodate the 18 degree angular difference arising from the angled plane of the valve gear, necessitated ball joints at each end — the joint covers can be seen in one of the photos.

On the 'off-side' photo an eccentric can be seen on the end of the main shaft for driving a water pump. Since this photo was taken, a new eccentric has been made along with the water pump, and fitted.

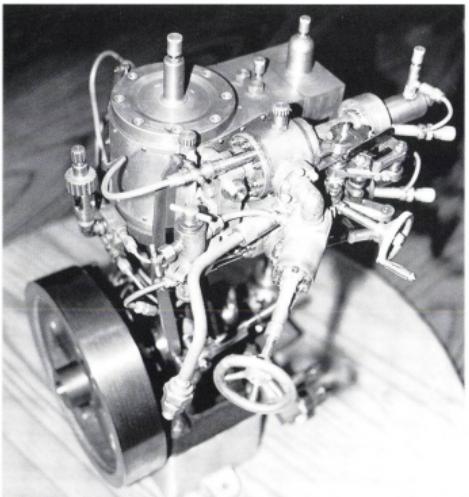
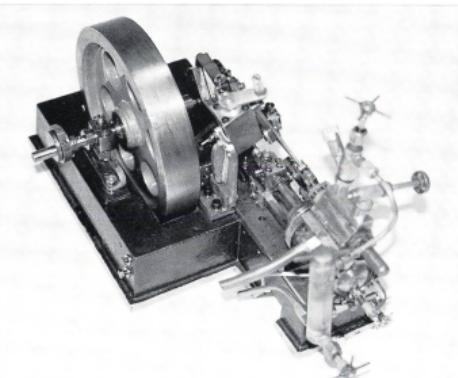
In my retirement, amongst my projects, I have constructed another stationary steam engine, completed about two years ago, and the valve gear on this one could well be unique.

It is a vertical engine, about twice the size of the Stuart No 10. It is non-reversing, the inlet valves being operated by a horizontal modification of the well-known vertically operated drop valve gear of Cole, Marchant & Morley design. Because this valve gear is oriented horizontally for my vertical engine, I couldn't refer to it as a 'drop' valve, so I coined the term 'snap' valve. It has been described briefly in the SMEE Journal, and a more extensive series of articles on its description are scheduled to be published in *Model Engineer* in the future. **(Photos 3 and 4)** show this very unusual engine.)

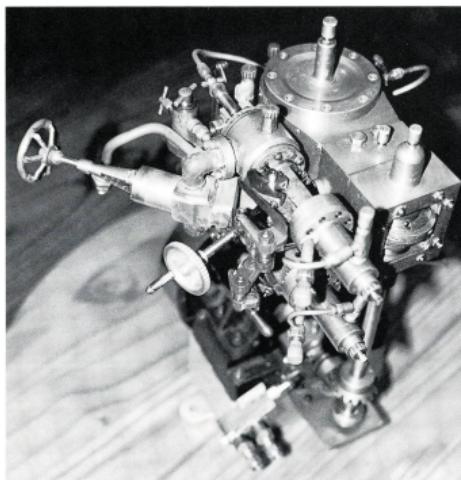
I have not yet come across a description of any vertical engine of commercial manufacture using a horizontal equivalent of the drop valve mechanism. I constructed it to make something different, and at



**Photo 1** (above) and **Photo 2** (below)



**Photo 3**



**Photo 4**

the same time demonstrate the working of the original drop valve mechanism. I chose the CM & M design to modify because, to me, it seemed to be by far the most neatly designed version.

In case anyone enquires about the exhaust valve gear on this engine, it is operated from the vertical layshaft by two silver-steel cams and pushrods on annular valves, so there's nothing unusual about it.

The whole of the valve gear is worked from a vertical stainless steel layshaft which is driven by two helical bevel gears from the main shaft — these can be seen in one of the photos. They are commercially made in Italy, probably from EN8 grade steel. I'll probably enclose them in an oil bath some time, so their being oversize won't notice...."

Thanks very much for the photos and the information, Mike. I must admit to a profound ignorance of drop valves. Can any of our readers give us any more information on the subject? I know they were widely used on later stationary steam engines but they don't feature in my library as yet....

#### **More from the Maurie Turner Collection**

John Lyas has kindly sent me details of the vertical boiler that Maurie uses to power some of his engines. **Figure 1** gives enough information, we believe, for anyone to produce a good working copy, aided of course, by their local boiler inspector! I realised that there was no mention of a burner and requested details of that too. John promptly talked to Maurie about it and furnished the following:

The burner is a standard gas ring about

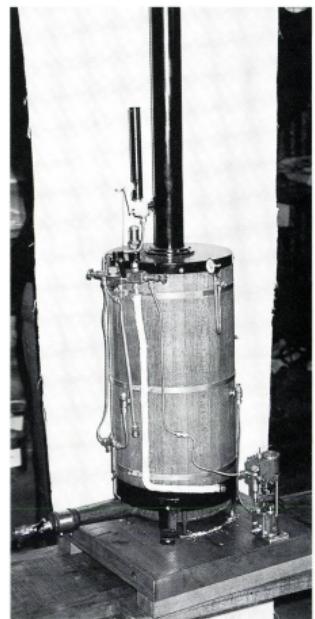
200mm dia. with a  $3/8$ "BSP threaded valve to control the flame. The only modification to this burner was that the vertical mounts, cast integral with the burner, were notched to allow the inner firebox to fit over the top and locate the boiler centrally above the gas ring. Maurie said he purchased it at a local barbecue store. They sell for about \$40. **Photo 5** shows the boiler complete with burner, a very neat solution to what is often a sticking point with gas-fired boilers.

On this subject, I

picked up something on the internet about ceramic burners for gas fired locos. These are available in the UK for about 35 pounds sterling for a burner + pipe + valve. The company is PPS Steam Models, Coach House, The Cooperage, Keyford, Frome, Somerset, UK BA11 1JX. Phone 01373 471 023.

While we're still talking Walschaerts valve gear, I thought **photo 6** worth including. This is Maurie's freelance single horizontal engine with Walschaerts gear operating slide valves. The engine has a clear steam chest cover for demonstration. The cast iron flywheel is  $5\frac{1}{8}$ " dia.

**Photos 7 and 8** show two approaches to a similar problem, that of supporting a crankshaft up in the air when used in the original vertical layout. Photo 7 is the *Georgina* design and has a flywheel  $5\frac{1}{8}$ " dia. Photo 8 is the Benson engine which



**Photo 5**

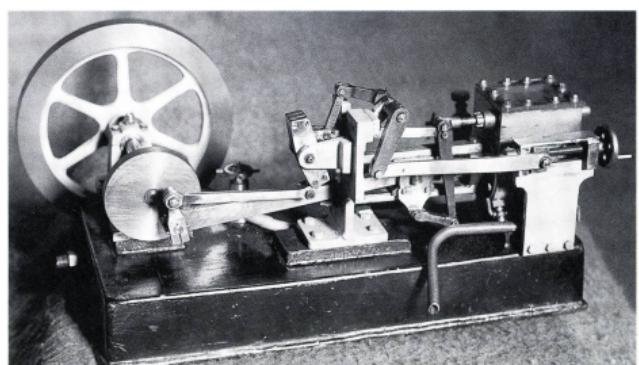
has been mentioned in recent Steam Chests; it has a 6" dia flywheel. Both engines are from *Model Engineer* plans.

Photos 6 - 8 are from the excellent collection of photos sent to me by John Lyas, which he took of Maurie Turner's range of model stationary engines. Thanks John! There'll be more in future Steam Chests.

#### **From The Sublime to the Humongous**

I mentioned last issue that Bob Williams from South Australia had sent me

**Photo 6**



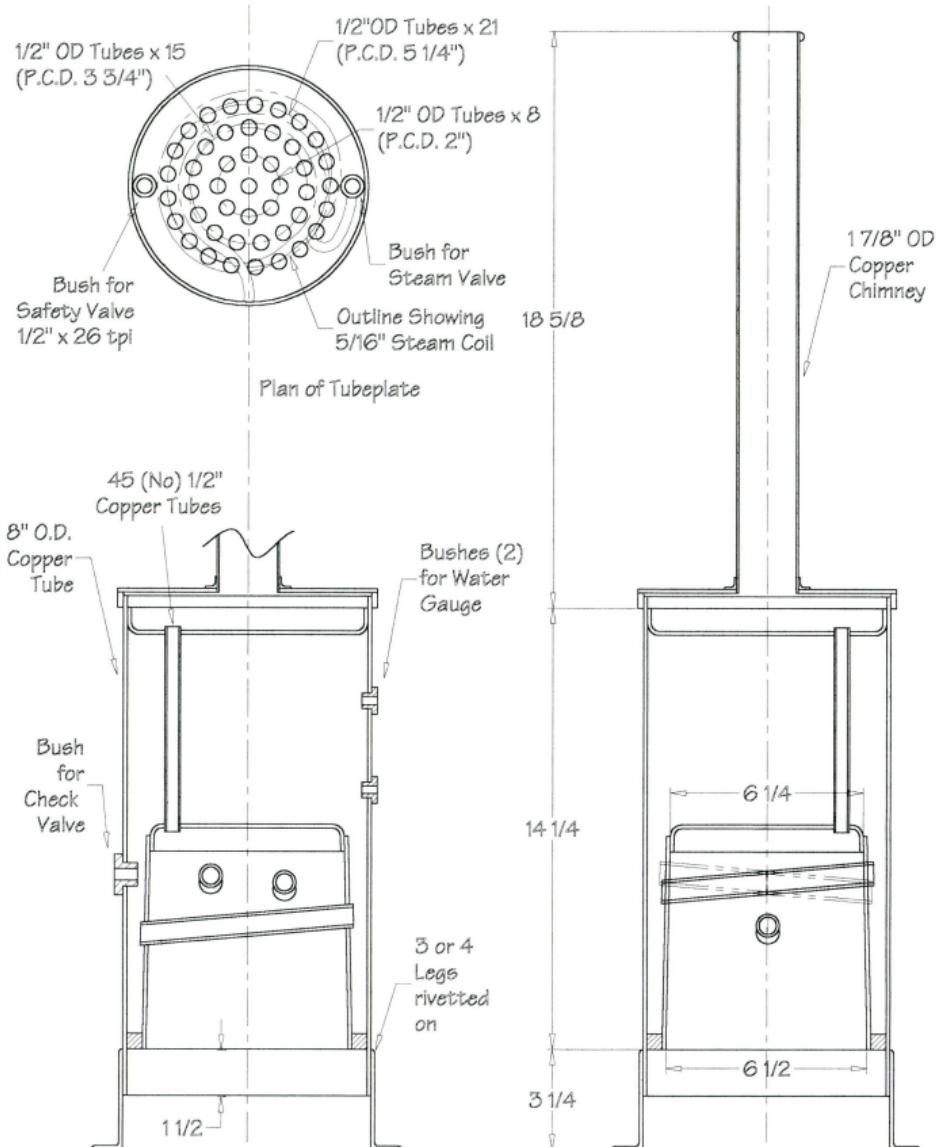


Figure 1

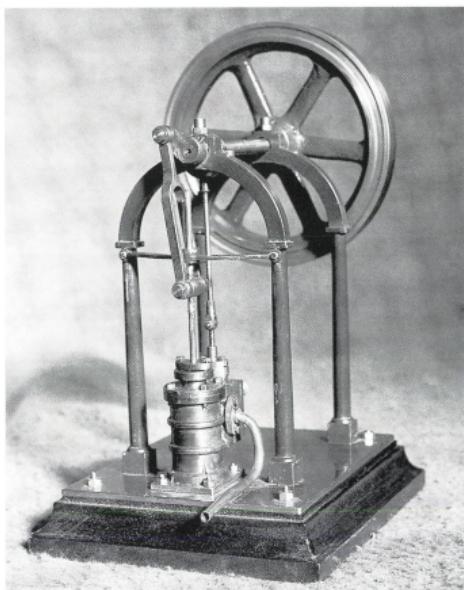


Photo 7



Photo 8

some great information of steam pumping engines from an old set of books he has. These are D K Clark's *The Steam Engine—A Treatise on Steam Engines and Boilers* published in 1890.

For a first offering from this goldmine of information, I've chosen the McNaught compound beam pumping engines

installed at Lambeth Waterworks, Brixton. They were built by J Simpson & Co. I'll quote from the original text, which has a style even more quaint than mine!

Two McNaught beam compound steam pumping engines were erected at the Brixton Pumping Station of the Lambeth Waterworks (Figure 2). The depth of foundation was limited, as the engines were to be placed in an extension of one of the existing engine-houses, and consequently the width also was fixed.

For the sake of compactness, comparative to the engines on cranks at right angles, Messrs Simpson had recourse to the McNaught system of compound

engines, the first and second cylinders being placed one under each arm of the beam; the second cylinder being under the end of one arm, and the first cylinder midway along the other arm. The pump is fixed close to the second cylinder, and strains on the beam are limited to a minimum.

Parallel motion is dispensed with for the second cylinder, the crosshead working in guides. But at the first cylinder the parallel motion is retained, the cut-off valves being worked from it. The first piston rod is prolonged downwards to work the air-pump, together with the feed-pump and the air-charging pump. The steam is condensed in a surface-condenser, one for each engine, the suction water passing through them on its way to the pumps.

The pumps are of the bucket-and-plunger type, and each pump has an individual air-vessel and delivery-main. The first cylinders are 24 inches in diameter, with a stroke of 3 feet; the second cylinders are 32 inches by 6 feet; the ratio of

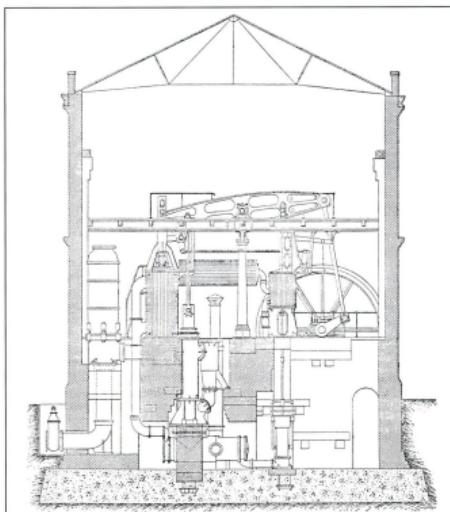


Figure 2

	High-lift engine	Low-lift engine
Duration of trial	11 hrs 40 mins	12 hrs
Pressure in boilers	60 psi	60psi
Head on Pump	304.9ft	216.6ft
Revolutions per minute	30.16	30.17
Vacuum	27.9 inches	27.6 inches
Coal consumed	50cwt 1qr 9lbs.	50cwt 1qr 9lbs.
Indicator horsepower	123.66hp	150.2hp
Duty per 112lbs of coal	106 million ft.-lbs.	106 million ft-lbs
Water pumped in 12 hours	808,269 gals	1,372,894 gals

capacities being as 1 to 3.56. The high-lift pump is 16½ inches in diameter; the low-lift 21½ inches, with a stroke of 4 feet and ¼ inch. A trial was conducted by Mr Taylor, of the two engines working together. Steam was supplied from three Lancashire boilers 7 feet in diameter, 28½ feet long, with two furnace tubes 2¾ ft in diameter, using Nixon's Navigation coal. The boilers are situated at a distance of 120 feet from the engines, and a considerable proportion of steam was condensed in the pipe though it was well clothed and drained." (The leading average results of the trial are shown at the foot of the previous page).

The drawing shows a very compact installation, and also how each engine was designed to fit the space available as well as the work required. Anyone fancy attempting a model of it?

Speaking of attempting models reminds me that some time ago I passed on several copies of details for Tower's spherical engine and a steam navy. I've often wondered whether the recipients actually tried building models from them. Care to let us know? My usual rate is a book of 45¢ stamps for a copy of these notes. I also have notes on the Hethorn-Davey differential pumping engines, plus the stuff that Bob Williams has sent me, and quite a bit on man engines. I'll have to make up a catalogue soon!

### Anyone want to go Winching?

Yes, I said winching, not wenching! I have a bit of a thing about steam winches, having restored two of the beasts at the Boiler House Steam & Engine Museum where I spend a lot of my time. It occurred to me that a steam winch would make a different subject to model, and Dave Sampson said he couldn't ever remember seeing a model steam winch, and he has an encyclopaedic memory for these things!

So, would anyone like to build a model steam winch? There are countless

different designs to choose from, from little steam capstans through log hauling winches, semi-portables, up to mine winding engines and crane hoisting and slewing winches. I've found quite a few drawings in my library, and numerous photos in my collection. The main stumbling block, I imagine, would be making the gears. Most of the frames could be fabricated, and the drums are fairly straight-forward.

Maybe if we had sufficient interest we could convince someone like John Strachan of Hobby Mechanics to produce a set of castings for a typical winch, including the gears. The latter could probably be cleaned up with a file well enough to operate; the real things are pretty rough, believe me!

Anyway, to start the ball rolling, I thought that I'd include a couple of photos of the winches that I am most familiar with; **photo 9** shows the first winch I restored. It is a small ship's winch of about 5" bore and 6" stroke. The base is about 4ft long and the main drum shaft about 5ft. It is what is called a third order winch, that is it's geared down twice between the crank-shaft and the drum shaft. **Photo 10** is a close-up of the crankshaft, and shows the simple disc cranks, single eccentrics and the intermediate gear and its shaft. The interesting thing about this winch is the valve gear; it's unlike anything I had come across, and it took me quite a while to work out how it functioned. There are two pipes leading to each cylinder from a reversing valve above. This valve is a simple D slide valve which, when operated by the lever, changes the pipes from steam to exhaust and vice versa. The valves on the cylinders are double ported, and work over four ports in the cylinder block instead of the usual three. I eventually tracked down this kind of valve gear in an old book on steam elevators! It was called the *Crane Steam Valve*, introduced by the Crane

Company of Chicago. More details another time!

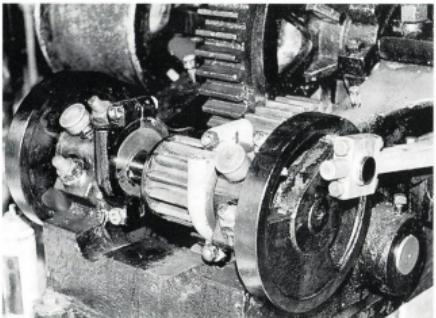
The other winch that I have restored is shown in **photo 11**, taken before restoration! It is a slewing winch that used to work on the old South Brisbane Dock, where the Queensland Maritime Museum is now located. Built by AUSN, this winch is even lower geared, being a fourth order winch. This is clearly done to give the fine control necessary for slewing a crane jib with precision. The extra reduction is achieved by what is obviously an extra section built on top of a standard winch; the top gear is mounted on steel plates bolted to the base castings. This winch has Stephenson's link valve gear and is about 6ft in length and width. Plenty of gear wheels in this one!

### Steam on the Web

I'm sure I've overrun my space this time, so I'll make this brief; I've had one email from a reader so far, thanks Dave! The web site for Man Engines is <http://www.aball.de/~gag/tkfaire.html>. This is a German engineer who studied these interesting machines and posted a list of the ones he found, mostly in Germany. It is in English though!

That's it for now, happy steaming!

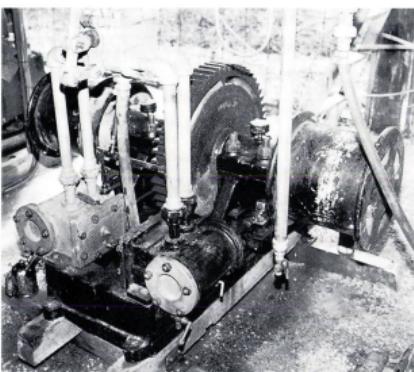
If you have email access, you can contact Dave Harper direct on [sandave@bytesite.com.au](mailto:sandave@bytesite.com.au)



**Photo 10** (above) and **Photo 11** (below)



Company of Chicago. More details another time!



**Photo 9**

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- Public running day
- Postal address

This listing has been sorted alphabetically by State and Club Name (in that order). There are bound to be slight problems with the list but it is as up-to-date as we know it. Club Secretaries please check your club's details for errors, or if your club is not listed, please inform AME as soon as possible.

The list is usually kept up-to-date from information supplied by club newsletters. Unfortunately, nearly all of them do not contain such basic information as public running days, hence the many "unknowns".

If your club has a Website, you can have a link placed on AME's Internet Club List Page by sending an Email to

[brian@ameng.com.au](mailto:brian@ameng.com.au)

with the subject "Club List". Please double check that the link URL you are supplying is correct.

Some clubs are listed as "No public running" but welcome visiting model engineers. The protocol is to write to the club first and arrange a mutual time for your visit. Members of clubs with AALS insurance are reminded that they should inform their home club of their intention visit other clubs.

## Australian Capital Territory

### Canberra Society of Model & Experimental Engineers Inc.

- KINGSTON, Geijera Place
- Last Sunday
- PO Box 4462, Kingston, ACT 2609

## New South Wales

### Bankstown Steam Locomotive Society Co-Op Ltd

- BANKSTOWN, Ruse Park, Hoskins Avenue
- 2nd Saturday
- PO Box 24, North Revesby, NSW 2212

### Bathurst Miniature Railway Co-Op Society Ltd

- BATHURST, John Matthews Sports Complex, Durham Street
- 3rd Sunday
- PO Box 574, Bathurst, NSW 2795

### Berry Railway Inc.

- BERRY, B35 Princes Highway
- No public running
- 49A Strongs Road, Jaspers Brush, NSW 2535

### Blue Mountains Railway Society Co-Op.

- BLAXLAND, Corner of Graham and Haymet Streets (Wasscoo Siding)
- 1st Sunday - except January.
- PO Box 20, Glenbrook, NSW 2773

### Central Coast Steam Model Co-Op Ltd

- NARARA, Lot 10 Showground Road
- 1st Saturday
- PO Box 692, Gosford, NSW 2250

### Hornsby Model Engineers Co-Op Ltd

- GALSTON, 29 Mid Dural Road
- 2nd Sunday
- PO Box 172, Galston, NSW 2159

### Illawarra Live Steamers Co-Op Ltd

- NORTH WOLLONGONG, Stuart Park, Virginia Street
- 4th Sunday
- PO Box 173, Woonona, NSW 2517

### Jerilderie Steam-Rail & Heritage Club

- JERILDERIE, (natural reserve town centre)
- To be advised
- C/- 64 Jerilderie St, Jerilderie, NSW 2716

### Lake Macquarie Live Steam Locomotive Society Ltd

- EDGEWORTH (Newcastle), Off Velinda Street
- Last Sunday (except Dec)
- PO Box 4040, Edgeworth, NSW 2285

### Mudgee Miniature Railway Co-Op Society Ltd

- MUDGEE, Corner of Cassilis Road and Buckaroo Lane
- 2nd Sunday
- PO Box 946, Mudgee, NSW 2850

### Museum Miniature Railway Society

- YANCO, Powerhouse Museum, Binya Street
- Unknown
- Unknown

### Orange Society of Model Engineers

- ORANGE, Matthews Park, Moulder Street
- 2nd Saturday
- PO Box 1485, Orange, NSW 2800

### Pacific Coast Railway Society Inc.

- CASINO, Cnr Queensland Rd and West St
- Every Sunday
- PO Box 176, Casino, NSW 2470

### Richmond River Mini-Railway & Model Engineers Inc

- ELLANGOWAN (20k SW of Lismore)
- None
- PO Box 269, Casino, NSW 2470

### Ridge Narrow Gauge Railway

- MANDALONG, Lot 11 Crooks Road
- No public running
- 10 Jewells Parade, Jewells, NSW 2280

### Southern Highlands Model Engineers

- ROBERTSON, Illawarra Highway.
- To be advised.
- C/O 44 Chapman Street, Moss Vale, NSW 2577

### Sydney Live Steam Locomotive Society Co-Op Ltd

- WEST RYDE, Anthony Road
- 3rd Saturday
- PO Box 124, West Ryde, NSW 2114

### Sydney Society of Model Engineers Inc.

- ST MARYS, R53 Luddenham Road
- Last Sunday except Dec.
- R53 Luddenham Road, St Marys, NSW 2760

### Tamworth & District Model Engineers

- None
- None
- C/- 1 Wade Ave, Tamworth, NSW 2340

### Tweed Valley Miniature Steam Railway

- DURANBAH, Duranbah Road, Tropical Fruit World
- 2nd and 4th Sundays
- 2 Lansell Ave, Currumbin, NSW 4223

### Twin Lakes Railway

- BUDGEWOI, Yellow Rock, Macleay Drive
- None
- 13 Garnet Rd, Pearl Beach, NSW 2256

### Wagga Wagga Soc. of Model Engineers

- WAGGA WAGGA, Botanic Gardens, Willans Hill
- 1st and 3rd Sundays
- PO Box 119, Mt. Austin, NSW 2650

### Warringah Model Engineers

- No track
- No public running
- 155 Willandra Rd, CROMER, NSW 2099

### Western Districts Live Steamers Co-Op Ltd

- FAIRFIELD WEST, Fairfield Showground, Smithfield Road
- First Saturday
- PO Box 403, Mt Prichard, NSW 2170

## Queensland

### Bracken Ridge Central

- BRACKEN RIDGE, McPherson Park, Denham St. (5"steam locos only)
- 4th Sunday
- 20 Talgai St, Bracken Ridge, Qld 4017

### Brisbane Live Steam and Model Engineers Society

- CARINA, Fursden Road
- 1st and Last Sundays
- PO Box 34, Red Hill, Qld 4059

### Grandchester Model Live Steam Assoc.

- GRANDCHESTER, 2 Ipswich Road
- UNKNOWN
- Lot 2 Gatton St, Grandchester, Qld, 4340

### Logan Model Engineering Society Inc

- WOODRIDGE, Ewing Park
- 2nd and 4th Sundays
- PO Box 427, Slacks Creek, Qld, 4127

### Mackay Society of Model Engineers Inc.

- MACKAY, Muller Park, Planlands
- 1st Sunday
- PO Box 5267, Mackay Mail Centre, Qld 4741

### Model Engineers & Live Steamers Association Inc - Bribie Island

- BRIBIE ISLAND, Toorbul Street, Bongaree
- 3rd Sunday
- PO Box 170, Bribie Island, Qld, 4507

### Model Engineers & Live Steamers Association - Gladstone

- CALLIOPE, Bruce Highway
- Unknown
- PO Box 1112, Gladstone, Qld 4680

### Model Engineers & Live Steamers Association Inc. - Maryborough Qld.

- MARYBOROUGH, Queen's Park
- Last Sunday
- PO Box 355, Maryborough, Qld 4680

### Model Engineers & Live Steamers Association - Rockhampton Inc.

- ROCKHAMPTON, Leichhardt Park, corner of Cambridge and Kent Streets
- 1st Sunday (pm)
- PO Box 1463, Rockhampton, Qld 4700

### Queensland Society of Model & Experimental Engineers

- WARNER, Lot 5, Warner Road
- No public running
- PO Box 322, Everton Park, Qld 4053

### Redlands Model Engineers Club Inc.

- CAPALABA, Sir John Frederick's Park, Banfield Lane
- 1st and 3rd Sundays
- PO Box 5098, Victoria Point, Qld 4165

## South East Queensland Live Steamers

### MARSDEN

- Unknown
- 760 Brown's Plains Rd, Marsden, Qld 4132

### Sunshine Coast Modellers Society

- NAMBOUR, Florence Street
- 4th Sunday
- PO Box 234, Nambour, Qld 4812

### Toowoomba Live Steamers Inc.

- TOOWOOMBA, Kearney Springs Historical Park, Spring Street
- 3rd Sunday (pm)
- PO Box 916, Toowoomba, Qld 4350

### Townsville and District Society of Model Engineers Inc.

- TOWNSVILLE SOUTH, Boundary Street
- Last Sunday
- PO Box 90, Hyde Park, Qld 4812

## South Australia

### Adelaide Miniature Steam Railway Society

- PROSPECT, 370 Regency Road
- 4th Sunday
- PO Box 205, Prospect, SA 5082

### Morphett Vale Railway Inc.

- MORPHETT VALE, Wilfred Taylor Reserve, Wheatsheaf Road.
- 2nd and 4th Sundays (pm)
- PO Box 743, Morphett Vale, SA 5162

### Penfield Model Engineers Society Inc.

- SALISBURY, Penfield Avenue.
- Last Sunday of the month.
- PO Box 792, Salisbury, SA 5108

### Port Augusta Model Engineers Inc.

- PORT AUGUSTA, Homestead Park, Elsie Street.
- 1st Sunday.
- 61 Edinburgh Tce, Port Augusta, SA 5700

### Roseworthy Railway Inc.

- ROSEWORTHY, Roseworthy Campus.
- 3rd Sunday.
- Cnr Chamberlain & Harding Sts., Willaston, SA 5118.

### South Australian Society of Model & Experimental Engineers Inc.

- MILLSWOOD, Off Millwood Crescent
- 1st Sunday and 3rd Saturday
- PO Box 208, Goodwood, SA 5034

## Tasmania

### Evandale Light Railway and Steam Society Inc.

- EVANDALE, Rear of Falls Park
- Last Sunday
- C/o 36 Collins St, Evandale, Tas 7212

## Hobart Miniature Steam Locomotive Society Inc.

- LINDISFARNE, Flagstaff Gully Road
- None
- 22 East Derwent Highway, Lindisfarne, Tas 7015

### Van Diemen Light Railway Society

- DON, Don River Railway
- Most Sundays and Public holidays.
- C/o Post Office, Don, Tas 7310

### North West Model Engineering Society

- ULVERSTONE, Maskells Reserve
- 3rd Sunday
- 51 Alexandra Road, Ulverstone, Tasmania 7315

## Victoria

### Altona Miniature Railway Inc.

- NORTH ALTONA, Paisley Park, Blenheim Road
- 3rd Sunday
- PO Box 387, Altona, Vic. 3018

### Ballarat Society of Model Engineers Inc.

- WARRENHEIP, Dorrington Road
- No public running
- 4 Gracefield Road, Brown Hill, Vic. 3350

### Bendigo Society of Model Engineers

- No track
- No public running
- Bendigo, Vic

### BHP Western Port Railway Society

- HASTINGS, Denham Road
- No public running
- Private Bag 1, Hastings, Vic. 3915

### Box Hill Miniature Steam Railway Society Inc.

- BOX HILL, Elgar Park, Corner of Elgar Road and Belmonte Road
- 2nd and 4th Sundays
- PO Box 61, Box Hill, Vic. 3128

### Campaspe Valley Railway Inc.

- ECHUCA
- Queen's Birthday weekend
- PO Box 151, Echuca, Vic. 3564

### Diamond Valley Railway Inc.

- ELTHAM, Eltham Lower Park, Main Road
- Every Sunday and Pub. Holiday
- PO Box 245, Eltham, Vic. 3095

### Euroa Miniature Railway Inc.

- EUROA, off Turnbull Street via Hunter St
- 4th Sunday
- 2 Nelson Street, Euroa, Vic. 3666

### Geelong Live Steam Association

- GEELONG, Portable elevated track in use.
- No public running
- 38 Hazelwood Crescent, Leopold, Vic. 3224

### Geelong Society of Model Experimental Engineers

- GEELONG, No track.
- No public running
- PO Box 442, Geelong, Vic. 3220

### Gippsland Model Engineering Soc. Inc.

- TRARALGON, Newman Park, Peterkin St
- 4th Sunday
- PO Box 569, Morwell, Vic. 3840

### Gisborne Vintage Machinery Society Inc

- GISBORNE, Webb Crescent
- 1st Sunday
- PO Box 99, Gisborne, Vic. 3437

### Lake Hume Model Engineers Inc.

- WODONGA, Diamond Park, Lincoln Causeway (Hume Highway)
- 3rd Sunday
- PO Box 1017, Wodonga, Vic. 3698

### Loddon Miniature Steam Locomotive Society Inc.

- EDINGTON, McColl Street
- 4th Sunday
- 17 Lowndes St, Bendigo, Vic. 3550

### Melbourne Society of Model & Experimental Engineers

- No track
- No public running
- 11 Kirkwood Drive, Camberwell, Vic. 3124

### Mooroolbark & District Miniature Railway & Steam Club Inc.

- KILSYTH, Kiloran Reserve, Hawthorn Rd
- 4th Sunday
- PO Box 231, Mooroolbark, Vic. 3138

### South Western Model Engineers

- COBDEN, operates at the Cobden Miniature Railway, Grayland Street
- 3rd Sunday
- 14 Peter St., Cobden, Vic. 3266

### Springvale Live Steamers Inc.

- SPRINGVALE, Alex Nelson Reserve, Harold Street
- 3rd Sunday
- 110 Patty St, Mentone, Vic. 3194

### Steam Locomotive Society of Victoria Inc.

- MOORRABBIN, 128 Rowans Road
- 1st Sunday
- PO Box 1115, Moorabbabin, Vic. 3189

### Tullamarine Live Steam Society

- BULLA, 15 Green Street
- 1st and 3rd Sundays
- PO Box 107, Tullamarine, Vic. 3043

### Wandong Live Steamers Inc.

- Wandong, The Dene (off Wallan Bradford Rd.)
- No public running
- 7 Felicia Grove, Forest Hill, Vic. 3131

### Wimmera Live Steam and Model Engineering Society

- HORSHAM, Golf Course Road (adjacent to wool factory)
- Unknown
- 57 Churchill Rd, Horsham, Vic. 3400

## Western Australia

### Castledare Miniature Railway

- WILSON, Rear of 100 Fern Road
- 1st Sunday
- PO Box 337, Bentley, WA 6107

### Katanning Miniature Railway

- KATANNING, All age play area
- 1st and 3rd Sunday afternoon
- 37 Amber St, Katanning 6317

### Northern Districts Model Engineering Society (Perth) Inc.

- BALCATTA, Vasto Place
- No public running
- PO Box 681, Balcatta, WA 6021

### South West Model Engineers Association (WA) Inc.

- BUNBURY, Forrest Park, Blair Street
- 3rd Sunday
- 10 Clifton St, Bunbury, WA 6230

### Western Australia Model Engineer Club

- No track
- No public running
- PO Box 84, Gosnells, WA 6110

## New Zealand

### North Island

### Auckland Society of Model Engineers Inc.

- PANMURE, Peterson Road Reserve, Waipuna Rd.
- Every Sunday (Weather permitting)
- PO Box 14570, Panmure

### Hamilton Model Engineers Inc.

- HAMILTON, Minogue Park, 24 Tui Avenue, Forest Lake
- Every Sunday
- 51 Alderson Road, Hamilton 2001

### Havelock North Live Steamers & Associates Inc.

- HAVELOCK NORTH, Keirunga Gardens, Pufflet Road, Hawkes Bay
- 1st and 3rd Sundays
- C/o 2 Ashford Place, Havelock North 4201

### Hawkes Bay Model Engineering Society Inc.

- NAPIER, Anderson Park
- Unknown
- C/o 214 Ikanui Road, Hastings 4201

### Hutt Valley Model Engineering Society Inc.

- PETONE, Marine Parade
- Every fine Sunday
- Marine Parade, Petone 6008

### Kapiti Miniature Railway & Associates

- PARAPARAHU, Marine Gardens Railway, Raumati Beach
- Every Saturday and Sunday
- PO Box 296, Paraparaumu 6540

### Maidstone Model Engineering Society Inc.

- UPPER HUTT, Maidstone Park.
- Unknown
- 95 Holdsworth Avenue, Trentham

### Manukau Live Steamers Inc.

- MANGERE, Mangere Centre Park, Robertson Road
- Every Sunday
- Box 43-095, Mangere Town Centre, Auckland 1730

### New Plymouth Society of Model Engineers

- NEW PLYMOUTH, Cnr Liardet and Gilbert Streets.
- Every Sunday
- 11 Gilbert Street, New Plymouth 4630

### Palmerston North Model Engineering Club

- PALMERSTON NORTH, Marriner Reserve, Marriner Street
- 1st and 3rd Sundays (Weather Permitting).
- C/o 22b Haydon St, Palmerston North, 5330.

### Rotorua Society of Model Engineers

- ROTORUA, Te Amorangi Museum, Robertson Avenue, Holdens Bay
- 2nd Sunday
- Box 7108, Te Ngae 7108

### Tauranga Model Marine and Engineering Club

- TAURANGA, Memorial Park
- Every Sunday
- 326a Devonport Road, Tauranga 3001

### Thames Small Gauge Railway Society

- THAMES, Brown Street
- Every Sunday (pm)
- PO Box 653, Thames

### Wanganui Model Engineering Society

- WANGANUI, 70a Alma Road
- Unknown
- 70a Alma Road, Wanganui 5001

### Whangarei Model Engineering Club

- MAUNU, Heritage Park, Highway 14
- Unknown
- 90 Otaika Road, Whangarei 101

## South Island

### Ashburton Steam and Model Engineering Club

- ASHBURTON
- Unknown
- C/o 34 Bathurst Street, Ashburton 8300

### Canterbury Society of Model Engineers

- CHRISTCHURCH, 26 Andrew Crescent
- 1st and 3rd Sundays
- PO Box 33294, Christchurch

### Gore Model Engineering Club Inc.

- GORE, Hamilton Park, State H'way One
- 3rd Saturday
- C/- 49 Hamilton Street, Gore 9700

## Marlborough Society of Model Engineers

- BLENHEIM, Brayshaw Park
- 1st Sunday
- 8 Author Baker Place, Blenheim 7315

## Nelson Society of Modellers Inc.

- NELSON, adjacent to Tahunanui Beach, Walkare St. Tahunanui
- Every Sunday (pm)
- PO Box 810, Nelson

## Otago Model Engineers Society

- DUNEDIN, Kettle Park
- Unknown
- Box 2613, Dunedin 9030

## Picton Society of Model Engineers

- PICTON, Foreshore
- Unknown
- C/o 42 Wairau Road, Picton, 7372

## South Canterbury Model Engineers

- CANTERBURY SOUTH, Anzac Square
- Unknown
- 238 Wai-iri Road, Timaru, 8601

## Southland Society of Model Engineers Inc.

- INVERCARGILL, Surrey Park
- None
- Box 216, Invercargill, 9530



# Control Taps

by Stuart Daniels

*Drawing for publication by John Shaw*

H ave you tried to build taps and find that they continually leak? Well that was my experience with my first endeavours with making these taps. Even with taking the spindle to work and grinding the nose cone on a special grinder, they still would not seal. But after some experimenting — success every time.

Start with the front piece which I made from  $3/8"$  hex brass. Even though we have been metric for over thirty years I find some materials are still in the old imperial dimensions. Chuck a piece of material and turn to  $1/4"$  dia. for about 6mm then thread with 40 tpi. Turn the end face slightly chamfered as per the drawing. Centre-drill and drill 3.5mm dia. Before moving the chuck jaws. This is a must so that all the machined parts are concentric to each other, as this will effect the effective sealing later. Part off about a length of 19mm and this can be machined at a later time.

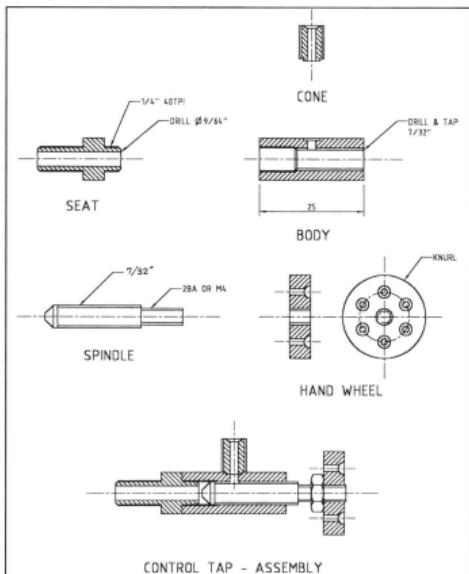
The next part is the body which is also from the same material —  $3/8"$  hex brass. Chuck, leaving at least 32mm out of the jaws. Face and centre-drill followed by the tapping of the  $1/4"$  with 40 tpi. Then drill and tap for the  $7/32"$  Whit thread. I use Whitworth here to give a quick action to the turning on and off of the steam. I tried 4mm but found it too fine a thread and it took too long to open and close the tap. By doing these operations all in the one setting you will find that they should all remain concentric, thus leaks will not occur. I then screw in the first part that was made and turn the other end to  $1/4" \times 40$  tpi. When it is removed, part off the body to the required length, which in this case is about 25mm. Reverse in the chuck and turn down the end to  $1/4"$ . That will carry the gland nut if you want one, but I have not shown it in the drawing.

The spindle is made from stainless steel, which is a lot tougher, so watch your speeds or you will burn your tool very quickly. If the chips are coming off coloured, then you are certainly going too fast. If you have a very small centre-drill (no. 1), centre-drill the end for support as the part becomes very skinny. Otherwise use a very sharp tool with a small nose radius and the job should not climb up over your tool while turning. Turn the whole diameter to 5.4mm (.215"), which is clearance on  $1/4" \times 40$  tpi. Then turn the  $3/16"$  dia (0.187") for the thread and turn down the remaining spindle to 4mm to take the control wheel and lock-nut. I then part off, but with a tool ground to give the nose angle that is required. I find that I have to plunge in further till I achieve the required result. If you part off and reverse in the jaws you will not get the spindle to run true, thus defeating the purpose of the exercise. The only way it will run true if you wish to part off is if

you have collets or some very special equipment, not available to most of us. I plunge in slowly, then turn backwards to give a good finish to the working surface. I know this method will upset some people but it is effective.

The cone is simple to turn up so should not require any explanation on how to make it, but I've made a simple jig to hold it in place while I silver braze it. The only thing to watch is when drilling in brass, it tends to dig in. Use a brass drill if you have any trouble. That is grind a small flat on the leading edge to give a zero rake to the flutes and no more problems.

The spindle needs to be assembled into the body, then the control wheel and lock-nut can be screwed on. Good luck and no more frustrations, I hope!





## 10th Miniature Traction Engine Rally — 1998

Story by John Oliver and David Proctor

Photos by David Proctor

The national capital was the scene for the 10th Miniature Traction Engine Rally which was hosted by the Canberra Society of Model and Experimental Engineers. After becoming well established in the northern half of NSW, there was some uncertainty by the organisers as to how successful a move to the south would be. Now that it is all over, chief organiser, Dick Whitfield, and his team are 'over the moon' so to speak. The 1998 Rally has generally been hailed as being 'almost as good as Inverell' which is high praise indeed. The owners and drivers of the 17 engines in attendance were able to enjoy a new venue in perfect weather all weekend, except for a couple of light showers on Sunday.

### The venue

Although the event was held at a model railway site (which to some is definitely 'not on', for reasons we are yet to fathom out), everyone had the chance to run their machinery on whatever surface they wished, from grass, gravel, bitumen, or if they were public roads.

face they wished, from grass, gravel, bitumen, or if they were

public roads.

The CSMEC grounds are located in the Canberra suburb of Kingston, adjacent to the Canberra railway yards and the ARHS museum. There are some large areas of vacant land around the area as well. After placing level crossings over the CSMEC's railway track, the engines were able to be driven around the vacant land, through the miniature railway complex, down a dead-end street, and in the case of some of the more adventurous, down the hill and through the railway yards, the scene of this issue's cover photo. Late on Saturday afternoon, Bill Fowler and Dave Watkins were obviously enjoying themselves so much in the railway yards that they didn't notice the gates being locked. After a



ACT Urban Services Minister, Brendan Smyth, tries his hand on Roydon Burk's Cliff & Bunting in the Grand Parade



John Gibson prepares his 2" scale Durham & North Yorkshire agricultural engine for another run



Bob Campbell checks the fire before heading on another excursion behind his Alchin

great burst of exploration they were able to find another way out by taking a rather long route through the museum grounds and railway sidings.

There is something different about a traction engine rally as opposed to a railway weekend, not that I (John) am knocking the railway people because I'm one of them as well, but everyone seems to get to meet everyone else during the weekend. Perhaps it's because we are not restricted to a track and the need to keep moving. If you want to stop and have a yarn with the bloke in front, behind or beside you, then you just stop. In fact there was one gentleman from South Australia (no names mentioned) who hardly got going all weekend.

### A weekend of fun

People started arriving on Friday and they were able to settle in with a BBQ that evening, ready for an early start on Saturday. More people began arriving early on Saturday morning and by nine o'clock the local lads and most of the visitors were well organised, engines were already unloaded, some in steam, and everyone was already catching up on the news of the last twelve months (not necessarily all true!). By 11am a couple of the more optimistic tried to get everyone lined up for the Grand Parade and they eventually succeeded. Once they were all lined up the weekend's proceedings were officially opened by the ACT Minister for Urban Services, Brendan Smyth (try to do

## Engines at the rally

### Engine

Tasker & Sons Little Giant  
Undertype steam wagon  
Alchin Royal Chester  
Cliff & Bunting  
Burrell  
Durham & Nth Yorkshire  
O B Bolton  
Foden steam wagon/train  
Foden steam wagon  
Burrell  
Buffalo Pitts  
Alchin Royal Chester  
Case  
Cliff & Bunting

### Owner

Bill Fowler (Dungog)  
Jeff Schaeffer (Adelaide)  
Bob Campbell (Brisbane)  
Royden Burk (Wagga Wagga)  
Ken Connon (Sanctuary Point)  
John Gibson (Sydney)  
John Oliver (Canberra)  
David Watkins (Mudgee)  
Martin Yule (Sydney)  
Stan Henstock (Canberra)  
John Levers (Adelaide)  
Colin Jones (Canberra)  
Lindsay Drabsch (Canberra)  
John Henderson (Sanctuary Point)

In addition to these engines which were all running over the weekend, Kevin Wadley from the Lake Hume club brought a trailer containing a partly built Ruston/Proctor which he had acquired. It should keep him out of trouble for a while!



Martin Yule's Foden, seen in a rare moment of inactivity, although not yet finished, proved to be a speedy performer



Above: Jeff Schaeffer's steam wagon was the only vertical boilered vehicle in attendance on the weekend and drew a lot of attention as it literally sped around the grounds.  
Below: Lindsay Drabsch was quite content to let his Case take itself in the Grand Parade, while he walked alongside.





*Bill Fowler takes the ladies for a ride behind his Little Giant*

anything in Canberra without involving a 'polly!), who then led the parade on Roydon Burk's Cliff & Bunting. By early afternoon, engines were spread all over the place, to the extent that some of them were getting hard to find.

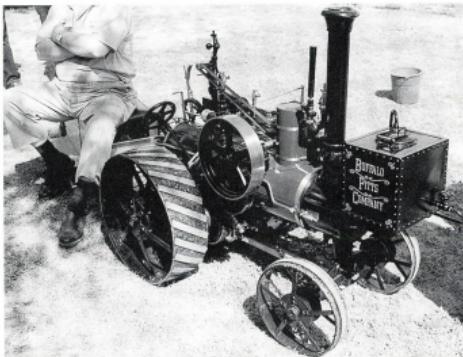
The Slow Race was won by Bob Campbell from Queensland, while John Oliver just could not get his O B Bolton engine to go slow enough. If he had looked over his shoulder he would have seen Dick Whitfield 'just helping a mate along'. The other event staged was the Slalem and, hey, were some of these chaps determined to win! After much sticking rigidly to the somewhat battered and stretched rules, Martin Yule eventually emerged with the fastest time with the markers still standing.

The activities continued into the evening until it was time for the spit roast and some rest from the day's 'hard work'.

## Serious business

Sunday morning was the time to get down to the serious business of the rally. A meeting of all those present was held to discuss the future of our hobby and the decisions made can be summarized as follows.

**Venue for the 1999 Rally** — It was agreed that this rally would be held at Inverell on October 23 and 24, to be organised by Gordon Blake. Discussion took place as to the type of models to be permitted at the rally as exhibits. The outcome was that models of steam traction engines, road vehicles and portable engines, models of internal combustion tractors, stationary engines and similar would be fine, but not to include commercial engines such as Briggs & Stratton. There was then a lively discussion as to the form and content of the "mailing list" and it was agreed that the list would be maintained broadly in its current



*John Levers' very fine Buffalo Pitts spent a lot of time in this pose as John passed the time with old friends*

form, with name, address and at the discretion of the owner, details of models completed and/or under way. Gordon Blake and Bob Campbell would undertake this task on a permanent basis and provide mailing lists to future rally organisers.

**Promotion of the non-locomotive hobby** — One of the more important points to come from this meeting was the fact that we, as traction engine, portable engine and road vehicle builders and owners, need to promote ourselves and the hobby and make ourselves available to other prospective hobbyists, to answer their inquiries and to give advice and assistance where needed. To this end five people volunteered to act as a contact person in their own state and on the motion of John Levers, seconded by Colin Limb, it was agreed to appoint a regional contact person in each state and to place a permanent classified advertisement in AME to this effect. The following contact officers were appointed:

### New South Wales

Gordon Blake, 71 King Street, Inverell, NSW 2360 (02) 6722 4272

### South Australia

John Levers, 3 North Terrace, Mannum, SA 5238 (08) 8569 2842

### Victoria

Kevin Wadley, 10 Robertson St, Myrtleford, Vic 3737 (03) 5752 2350

### Queensland

Bob Campbell, 4 Champagne St, Carseldine, Qld 4034 (07) 3263 7462

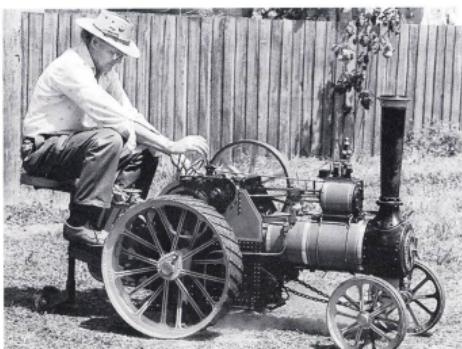
### Australian Capital Territory

John Oliver, 76 Hadleigh Cct, Isabella Plains, ACT 2905 (02) 6292 1938

It was agreed that each exhibitor at the Inverell Rally would be levied \$10 as a registration fee to finance promotion of the event. We'll see you there!



*A closer look at one of the wagons which formed the road train behind David Watkins' Foden wagon (see cover photo). The other wagon was a tanker which carried his water supply.*



*Stan Hennock has an unusual seat on his Burrell. It takes the form of a seat on top of a trailer jockey type wheel which slides freely up and down in its mount to follow the contours of the ground.*

# A Special Harold Sinclair Weekend

Havelock North Live Steamers, 12 to 13 September 1998

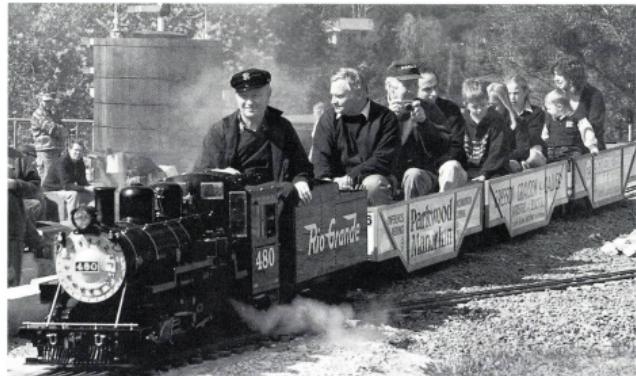
by Murray Lane

The Havelock North Live Steamers decided that it was time that Harold Sinclair should be honoured for the contribution that he has made to live steaming in New Zealand over the past 18 years. It was decided to bestow this honour in the form of an open weekend at the Havelock North Keirunga Park Railway with the aim of getting together as many as possible of the engines that Harold has made.



Harold Sinclair Photo: M Orange

The result was seven of his engines attended out of a possible 13. A good turn out considering that one only runs on a private track, three are overseas, and Frank Pemberton ended up in hospital on the night before he was due to travel down from Auckland. Many of those attending



Gavin McCabe driving No 7 down the bank above the station Photo: Mike Orange

did not bring engines as they preferred to give the owners of Harold's engines a fair go. All of the engines ran most of the weekend and made an impressive sight, most pulling three carriages fully laden for several hours each day.

A dinner was held on the Saturday night in Napier, with 104 friends attending. After the meal Harold was presented with a certificate for his work in the live steam arena, and he then delivered a speech on how he started out and the construction of the engines. Messages from the owners of the three overseas engines were read out Geoff Macpherson from the Box Hill and Diamond Valley clubs in Victoria Australia, Martin Rogers from his private track, the

Cowan Point Railway, on Bowen Island just north of Vancouver in British Columbia, and Fred Stauffer from the Swiss Vapeur Parc in Le Bouvent Switzerland. (This latter railway is highly recommended for any model engineer going to the continent). A display board was set up under the signal box at the club with messages and photographs of the engines and some details of the railways.

Harold was a late starter in this field compared to most of us and was getting close to retirement before making his first engine. He designed all the engines himself and does not use drawings, just sketches for some of the parts. He has just about produced a new locomotive and

## LIST OF ENGINES

Build No.	#	Bore & stroke	Boiler	Type dia.	Wheel	Prototype config.	No.	Name	Owner
2	5	2 x 2 <sup>1</sup> / <sub>2</sub>	6.5	Mikado	2-8-2	Pennsylvania	777	Pennsylvania	Ken Hill
3	5	2 x 2 <sup>1</sup> / <sub>2</sub> , 2 <sup>3</sup> / <sub>8</sub>	6.5	Mallet C	2-6-6-2	Serbian St. Ry	77	Broken River RR	Ian Welch
4	7/	2 <sup>5</sup> / <sub>8</sub> x 3 <sup>1</sup> / <sub>2</sub>	10	Prairie	2-6-2	Maine	7	Manukau Live Stm	F Pemberton
5	7/	2 <sup>5</sup> / <sub>8</sub> x 4 (4)	10	Mallet C	2-6-6-2	Serbian St. Ry	88	Cowan's Point RR	M Rogers
6	7/	2 <sup>5</sup> / <sub>8</sub> x 4 (4)	10	Mallet C	2-6-6-2	Serbian St. Ry	89	Swiss Vapeur Parc	Fred Stauffer
7	7/	3' x 4	10	Mikado	2-8-2	K36	480	Rio Grande	Ian Welch
8	7/	3' x 3' (4)	10	Mallet S	2-6-6-2	Freelance	25	Snowquamie Valley	Ian Welch
9	7/	3' x 4	10	Mikado	2-8-2	K36	482	Rio Grande	J Couchman
10	7/	3' x 4	10	Mikado	2-8-2	K36	491	Rio Grande	Ken Hill
11	7/	3' x 4	10	Mikado	2-8-2	K36	497	Rio Grande	G Macpherson
12	7/	2 <sup>5</sup> / <sub>8</sub> x 4 (4)	10	Mallet C	2-4-4-2	Freelance	8	Totara Timber RR	R Sharman
13	7/	2 <sup>5</sup> / <sub>8</sub> x 4 (4)	10	Mallet C	2-4-4-2	Freelance	26	Broken River RR	Ian Welch
14	7/	3' x 4	10	Prairie	2-6-2	Mod Maine	97	Sandy River RR	Eric Burns
15	7 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub> x 4	10	Prairie	2-6-2	Mod Maine	Uncompleted	G McCabe	Lance Beath
16	7/	2 <sup>5</sup> / <sub>8</sub> x 4 (4)	10	Mallet C	2-4-4-2	Freelance	Uncompleted		

Note: If you are curious about builder's number 1, it was a boat.



*Harold at the controls of his No 13, having just emerged from the upper tunnel at Havelock North*

*(Photo: M Orange)*

tender every year since starting in 1980 numbers 15 and 16 are almost completed and waiting for the tenders to be finished. All the engines are unique and recognisable. If a Harold engine is mentioned to any railway steam enthusiast in New Zealand they know immediately what sort of engine is being talked about. Harold has his own thoughts on design and construction methods and over the years has developed a very successful and reliable type. Some of the later engines are getting on to the size of the engine built by the author for the Burkes Pass Railway (see AME issue 56).

During the weekend a video showing Harold building an engine in his modestly fitted out workshop was run continuously. It was interesting to watch the piston valve bore being drilled in the cylinder block via a horizontal fitting on the end of a vertical mill. This allows horizontal boring along the main table, the drill was getting onto towards an inch in diameter. He does not core the piston valve bore due to previous problems with the blocks when cored. The frames are all cut at home with a gas axe



*Ian Welch blows No 8 down on the turntable*

*(Photo: M Lane)*

and he does not use a steady or a guide for the torch. A vertical slotter in the reverse end of the mill is used to finish the horn blocks off. A 12 inch grinder and 7 inch disk grinder are used extensively. Incidentally the completed engines are hand painted to a very high standard.

Numbers 5 and 6, Mallets, are  $7\frac{1}{4}$ " gauge versions of number 3, and with number 8, the firebox is located over the rear engine truck, resulting in very shallow firebox. Numbers 12, 13 and 16 are modifications of the aforementioned Mallets, and with the 2-4+4-2 configuration, allows the firebox to be located between the rear drivers and rear truck, allowing a much deeper firebox. The later 2-6-2 engines numbers 14 and 15 are modified from number 4 and have a much better balanced axle loading and appearance.

Although the engines are very different in size and wheel arrangement much of the design has been standardised. All the  $7\frac{1}{4}$ " gauge engines have 10 inch diameter Briggs type steel boilers and the bore and stroke are all similar and are fitted with his very successful water and air pumps. The Walschaerts valve gear construction is the same on all engines. Firebox doors are steam operated and all the solid wheels are made from steel. Normal teething problems aside, engines have proved to be very reliable and have probably pulled more passengers than all other engines in New Zealand combined.

At the time Harold started building locomotives there was little in the way of  $7\frac{1}{4}$ " tracks in New Zealand, and very few engines. Out of the 16 tracks in the North Island 12 have  $7\frac{1}{4}$ " and without his input into the  $7\frac{1}{4}$ " field these tracks would still be a novelty in this country. Most of the owners of the engines built by Harold, are not engineers and it is only because Harold builds engines which are suitable for these people, that they are now taking a very active part in the live steam hobby today.

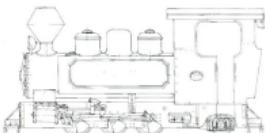


*Two more of Harold's engines being readied for the road.  
Above is No 3, one of the original 5" models, now owned by Ian Welch*

*(Photo: M Orange)*



# Bunyip



## A Bundaberg Fowler 0-6-2T in 7 1/4" gauge — part 5

by Ian Smith

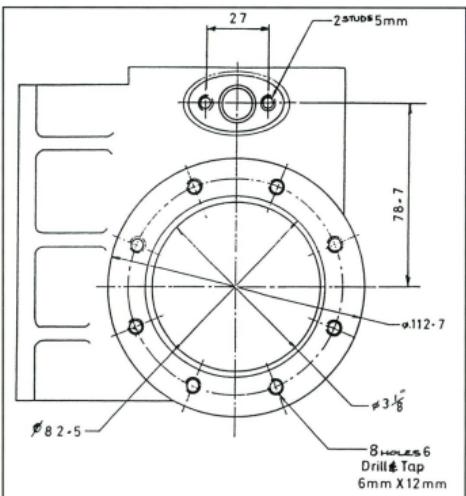
*Drawings and photos by the author unless credited otherwise*

### Cylinders

With an old file clean-up the castings, then paint them with red oxide. When they are dry, clamp the bolting face of the cylinder to the milling table, and take a light cut off the top side of the cylinder to make it parallel to the bolting face. Do not machine off the cylinder bosses, (photo 1). Now reverse the cylinder and put two parallel strips under the cylinder and clamp to milling table, take a clean-up cut on the bolting face (photo 2), as it is to be finished to size after the cylinder has been marked out using a vernier height gauge.

Clamp an angle plate parallel to the milling table and clamp the bolting face to it with the valve face down, put a square on the end of the cylinder to square it up (photo 3). Now check to see if the valve bosses are parallel to the milling table as they can be a little bit out when they are cast — do not worry about the cylinder bore as there is a lot to machine out of it. Take a 2mm deep cut right across the cylinder bottom face, 16mm wide with a 16mm end mill (photo 4). This is a reference face that a lot of the machining is taken from and is also used to set the cylinder up on the frames.

Cut a piece of scrap aluminium about 25mm x 6mm x the cylinder bore size and make it a very tight fit in the bore of the cylinder in either end, then paint it with lay-out stain. Clamp an angle plate to a marking out table or use the milling table. Sit the cylinder on a parallel strip 12mm x 25mm on the surface you have just machined, and clamp the cylinder to the angle plate. Set the vernier height gauge to 47.6mm above the top of the par-



Cylinder — end view

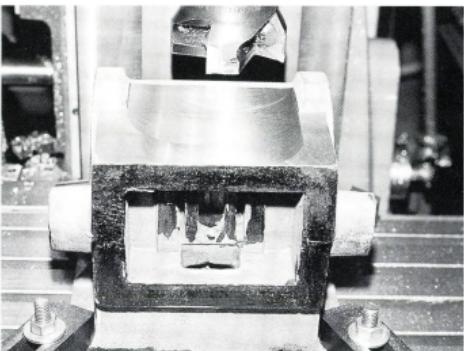


Photo 1

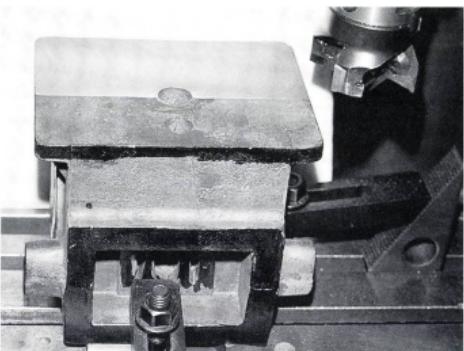


Photo 2

allel strip — this is the centre of the cylinder bore (photos 5 and 6). Scribe both ends of the bore. Now add 78.6mm to your last measurement and mark the valve boss ends, add another 17.4mm. This gives the height of the top of the slide valve chest opening. Scribe around the top to show how much has to be machined off the top. Take the cylinder off the angle plate and lay it flat on the marking out plate, bolting face down. With a pair of hermaphrodite callipers (jennies) find the centre of the cylinder boss, then lightly mark the centre. Now set the height gauge to that centre mark, and check the valve boss for centre. If a little bit out, adjust to suit and mark the centre line on cylinder and valve bosses. Take off 96mm and scribe all round. That will give the amount to be machined off the bolting face. With a prick punch, lightly centre-punch the cylinder centre as you will need to use it when setting up to machine the cylinder bore in

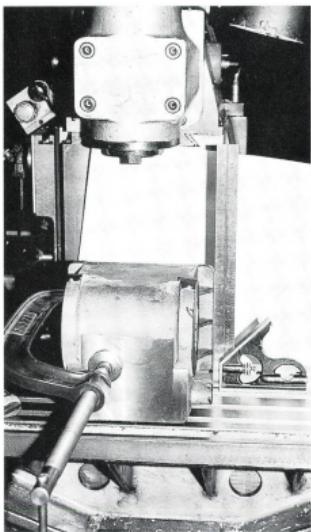
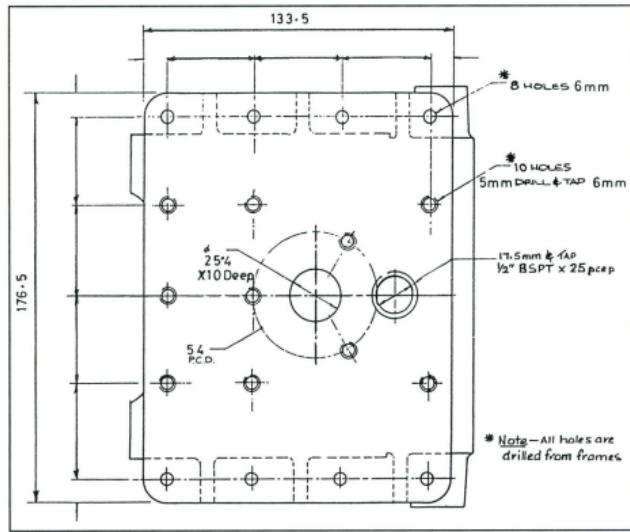


Photo 3



Cylinder — bolting face (to frames)

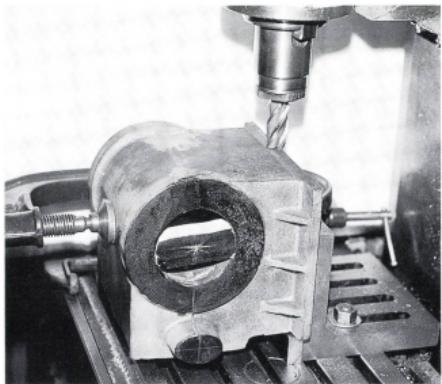
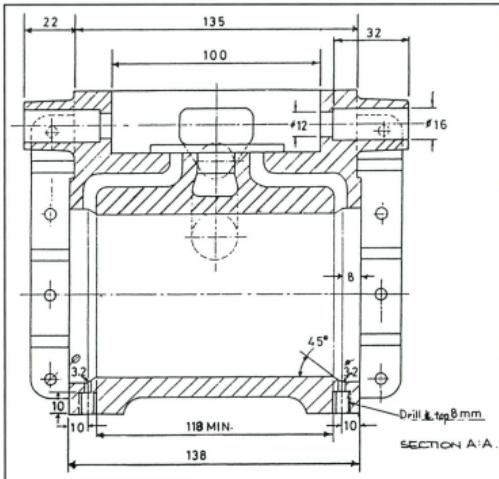


Photo 4

the lathe.

Clamp the cylinder on the same parallel strips as before and machine the bolting face to your scribed line (photo 7). Mount the angle plate back on the milling machine and set the cylinder up on the 12mm x 25mm parallel strip and machine the top of the valve chest to the scribed mark (photo 8). While the cylinder is in that position take a clean-up cut off the valve face — do not go down below 28.5mm as that is the finish size (photo 9). It will make it easier to make out the port openings later.

To machine the cylinder, it will have to be mounted on an angle plate bolted to a face plate in the lathe. Use a solid angle plate to stop vibration when machining. To keep the cylinder, the bore and valve and bolting faces parallel to each other, bolt a piece of 12mm x 25mm x 150mm BMS bar on to the angle plate. Set the bar up with a dial indicator using the lathe travel to get it accurate. Before mounting the cylinder on the angle plate, mark a line with



Cylinder — vertical section

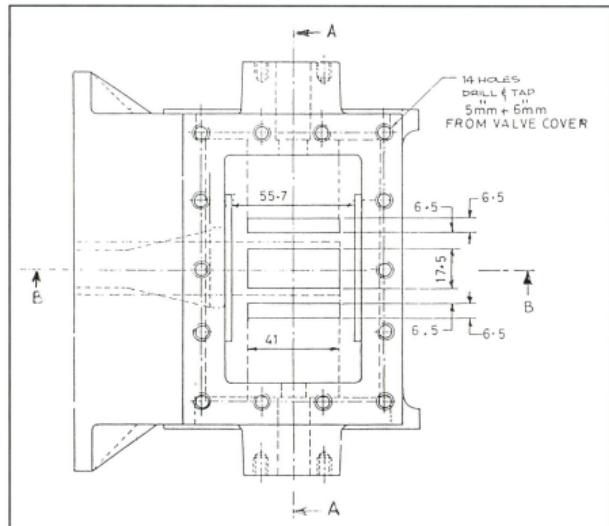
a pencil on the face plate 96mm below centre and another 46.6mm to one side to give the approximate position to where the cylinder will sit. Clamp the angle plate to the face plate to these marks. Clamp the cylinder on to the angle plate with the bolting face down and the 16mm wide machined strip hard up against the 12mm bar, using a set up bar made out of silver steel with a sharp 60° point machined on one end and a centre in the other. Use a collet in the lathe to get it accurate or set up in the four jaw chuck with a dial indicator.

Put the point of the bar into the centre pop you made and the other (photos 10 and 11), using a fixed centre (more accurate than a revolving centre), mount a dial indicator on the cross slide

as close as you can get to the cylinder and rotate the face plate. If it is not running true, loosen the bolts that hold the angle plate to the face plate but not so loose that the angle plate will move of its own, and use a soft hammer to move the angle plate so the set up bar runs true. Clamp every thing up nice and solid so nothing will move. Now you are ready to machine the cylinder bore.

Before starting to machine the bore you will have to check to see what piston rings you intend to use. I used two  $3\frac{1}{8}'' \times 1\frac{1}{8}'' \times 1\frac{1}{8}''$  cast iron rings in each of my cylinders or you could use Total Seal gapless rings, part no. (TS3)3125-078, in the same size that I had fitted to another *Bunyip*. I do not know what standard sizes they are made in metric. Leave the bore 0.15mm under size so they can be honed to the finish size. The local brake repairers honed the cylinder I had fitted the gapless rings to — the maker of the gapless rings recommends that the bore to be honed. In my locomotive they are bored to finish size and cast iron rings.

Take a clean-up cut across the front face of the cylinder, then a clean-up cut through the bore (**photo 12**). Check the distance through the bore to see how much has to be machined off both ends — the finish size is 138mm. Machine the bore to size, then machine a counter bore to 82.5mm diameter x 8mm deep with a  $45^\circ$  taper at the end of the counter bore. The taper will help when fitting the rings. The counter bore is there if at some stage the bore has to be machined again for any reason (you do not want to make new cylinder covers again).



Valve chest

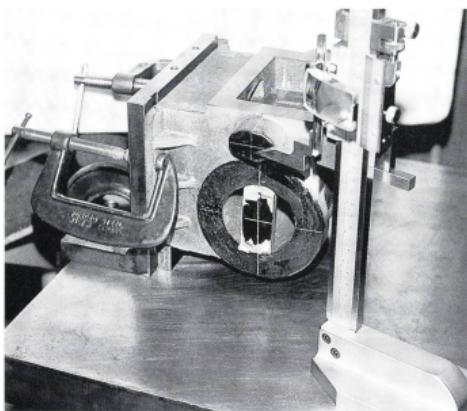


Photo 6

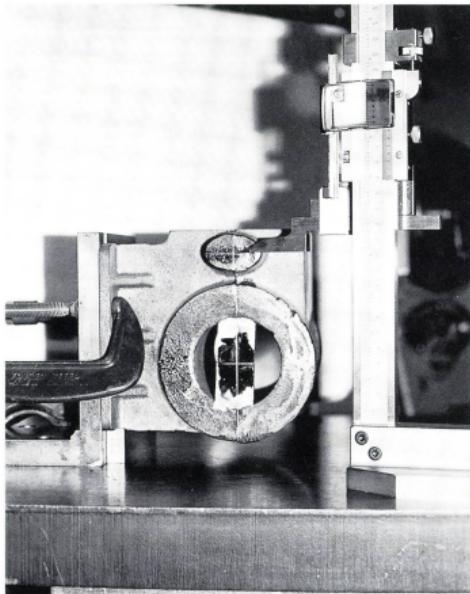


Photo 5

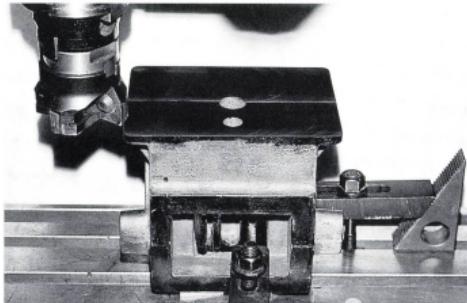
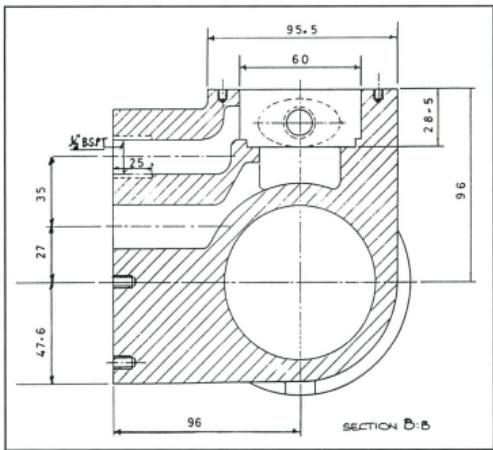
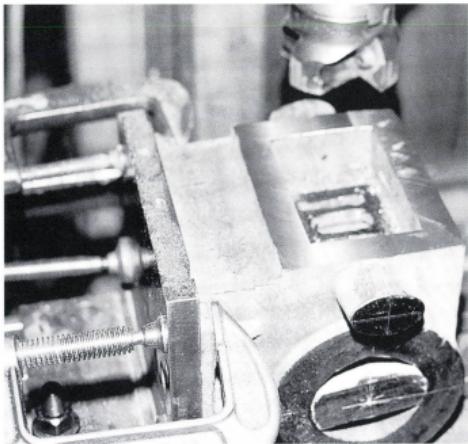


Photo 7



**Cylinder — cross section**



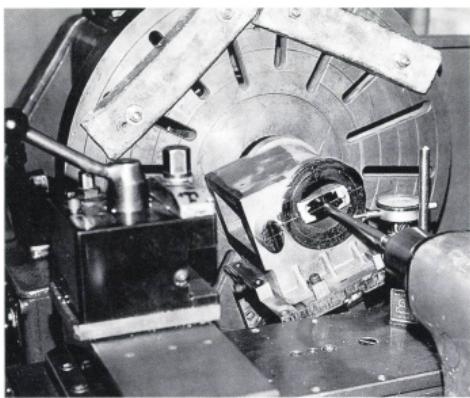
**Photo 8**

**DO NOT REMOVE THE CYLINDER FROM THE LATHE.** You can machine the back face of the cylinder boss and machine the counter bore as well (that was the way I machined ten cylinders).

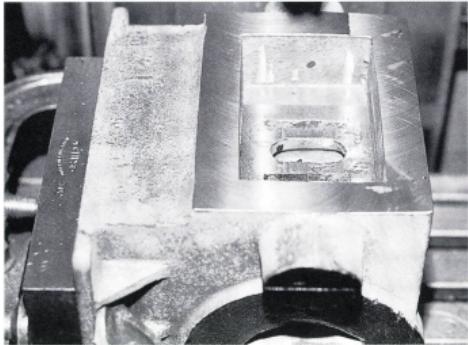
Back to the marking-off table to mark out the valve ports. With the bolting face down on the table, using the height gauge find the centre of the cylinder bore, transfer to the valve face then from that setting mark a line 20.5mm above and below it. Now clamp the cylinder to an angle plate, square the cylinder up to the marking-off table, find the centre of the valve port openings and mark out to the drawing. The exhaust port is 17.5mm wide x 41mm long and the inlet ports are 6.5mm wide x 41mm long. I did not square the ends of the ports as I used a 6mm end mill (I left the radius in them).

Mount the angle plate back on the milling machine table, parallel to the table travel, sit the cylinder on the same parallel strip as before and using a 6mm long series end mill, machine the ports. Now machine the port face to depth, take a very light and fine feed on your last cut at both ends. Using a 10mm slot drill undercut the valve face 1mm deep x 16mm wide. This will also help when lapping the valve face. The ends of the valve boss can be machined to size — they are 22mm long measured from the main casting face.

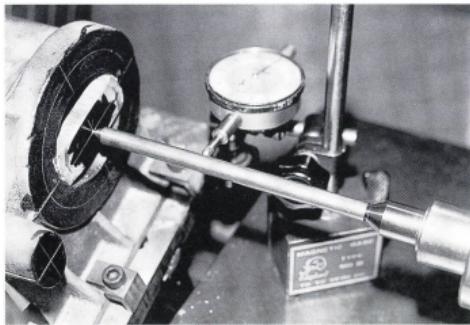
Now you drill and ream the valve rod holes. Using the same set up you have been using with the angle plate in the mill, clamp a BMS bar on the end of the angle plate so the machined edge will sit hard against it — the same as you did



**Photo 10**



**Photo 9**



**Photo 11**

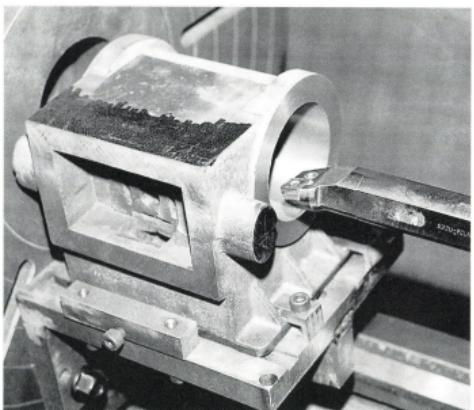


Photo 12

for boring the cylinder — come out 96mm from the angle plate. That will give the centre line of the bore. Now find the centre of the bore the other way, then move the table 78.5mm along to the valve guide boss, centre drill and ream for 12mm then drill and ream 16mm x 32mm deep. The bottom of the 16mm hole is flat. Machine both cylinders, clamp the BMS bar to the other end of the angle plate and repeat.

Before removing the angle plate from the mill, it can be used in the set-up for putting the steam inlet and exhaust holes in the bolting face. Use the same set up as you used for machining the bolting face, but put a parallel strip between the angle plate and the cylinder and clamp the same BMS bar to the end of the angle plate so it will register on the machined boss of the cylinder bore. This will give the same setting for each cylinder. Come in 75.6mm from the parallel strip and 69mm from the edge of the angle plate. That will be the centre of the cylinder both ways. Drill or bore the cored hole to 25.4mm x 10mm deep, as you will use this hole to set the cylinder up on the frames. Now move out another 35mm away from the angle plate, drill 17.5mm and tap for  $1/2$ " BSPT 25mm deep. Repeat on the other cylinder. That completes the machining of the cylinders. The drilling and tapping of the stud holes will be drilled from the cover plates.

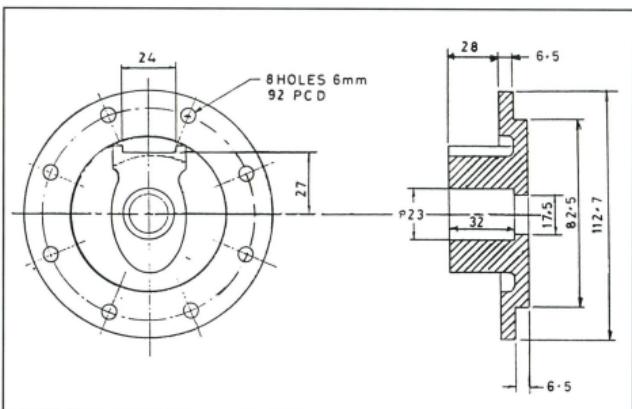
### Cylinder covers

The cylinder covers are a straight forward turning operation. The only thing to keep accurate is the fit in the counter bore — make it a firm fit with no slop, as it lines up the piston to the bore of the cylinder.

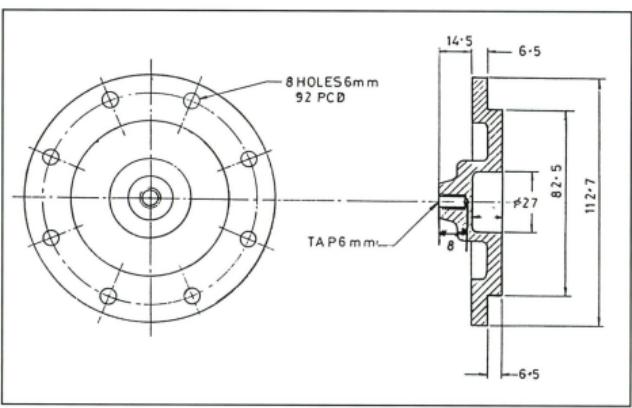
Make a jig to drill the stud holes in the cylinder covers. Turn up a ring 112.7 diameter with a 82.5 bore, to a sliding fit on the step of the cylinder cover x 8mm wide. Set up the dividing head on the milling machine or a rotary table, find the center of the bore, then come out 46mm radius and drill 8 equally spaced 5mm holes. Slide the jig on to a cylinder cover, position the holes either side of centre and drill the 5mm holes in the cover.

Fit the cover to the cylinder, making sure the top of the cross head boss is square with the bolting face of the cylinder. Drill the 5mm holes 10mm deep and number stamp the cover before removing so they will go back the same way again. The two top holes will go into the steam inlet but as you will be fitting studs in them there is problem. Open out the 5mm holes in the covers to 6mm, do not drill the holes 6mm clearance as they need to be a neat fit on the studs.

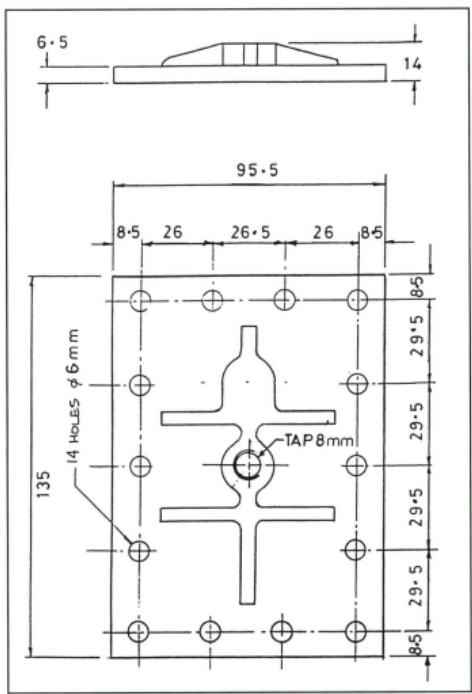
To machine the crosshead bar slot, temporarily bolt the cylinder cover on the cylinder with 6mm x 12mm long bolts. Set up the cylinder on the mill the same way as for machining the valve opening but with a side and face cutter mounted on a stub arbour held vertically. The reason for this is to get under the valve guide boss. Take a light cut off the top of the cross head boss, set up the other cylinder and do the same. Set the vice up on the milling machine, with a parallel strip clamped to the face you have just machined (with the



Rear cylinder cover



Front cylinder cover



**Valve chest cover**

side and face cutter). Use a small tool makers clamp that will go in the counter bore of the cover to hold the parallel strip, set the cover parallel with the milling table with a dial indicator and turn a short bar 23mm diameter to a nice fit in the counter bore of the

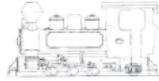
cover. Find the centre of the shaft, take note of the setting, and using a 8mm long series end mill, machine the slot to 24mm wide and 27mm from the centre of the counter bore to the bottom of the slot. Machine out as much as you can without hitting the front of the cylinder cover with the cutter.

The two 6mm tapped holes that take the studs for the piston gland are 34mm apart x 10mm depth of tread. Make a jig to drill the holes in the covers and the bronze glands as well. Use a piece of 10mm thick x 30mm wide x 40mm long steel set up in the lathe in the 4-jaw chuck, bore out the centre 23mm, the same as you machined the counter bore in the cylinder covers. With a pointed tool, scribe a line around the bore, 34mm diameter, then lay the tool on its side and scribe a line through the centre of the piece of steel, centre pop the intersecting lines and drill 5mm for 6mm tapping. Using the short piece of 23mm turned steel used in setting up the cylinder cover, put the bar in the counter bore and line up on centre of cross head. Resize and drill and tap. When the glands are made, the jig can be slipped over the boss and the holes drilled in them also. While you are in the mood, make one for the valve gland but with a 16mm bore and the two holes 27mm apart with 4.2mm hole for 5mm.

### Valve chest cover

Set up the cover in the lathe in a 4-jaw chuck and machine both sides to a finished size of 14mm. Using the milling machine, machine the valve cover to size 95.5mm wide x 135mm long. Use the vernier height gauge to mark out the position of the holes and drill them 5mm for 6mm tapping. With calipers mark the centre boss on top of the valve cover, and drill 6.8mm and tap 8mm. This hole is used to pump steam oil into the valve chest to lubricate the cylinder. Set up the cover on the valve chest opening with the offset boss facing the back of the locomotive, drill 5mm x 10mm deep and number stamp the cover before removing. Remove the cover, tap 6mm and open out the 5mm holes in the valve chest cover to 6mm. Use a 12mm diameter spot-facing cutter and clean up the casting to give a good seat for the holding down nuts.

*To be continued...*



## A Boiler Stay Hole Deburrer

by Ed Murrell

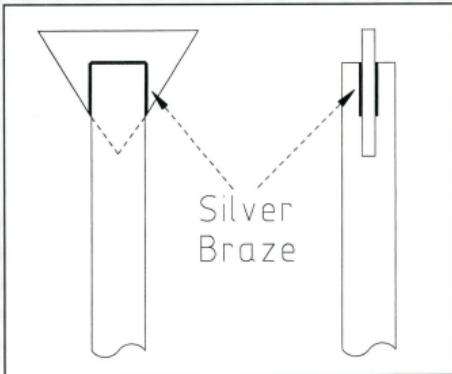
*Drawing for publication by Jim Gray*

When holes are drilled for firebox stays, a burr is raised on the hole inside the firebox, which is difficult to remove. I have made up a countersink which is fed from the inside, and which works quite well.

Cut a slot in the end of a steel rod, the size of the stays, insert a piece of hacksaw blade in the slot and silver braze in place. Grind to shape, remembering the clearance on the cutting edge, or it won't cut.

The tool is used by inserting through the hole from the inside, attaching your drill chuck on the outside end and giving the trigger a quick pull for a second. Check the work and if OK go on to the next hole.

An after thought — I head my stays to fit the countersink. This makes the firebox neater when they are in place. A slight bend on the outside with a pair of pliers will hold them in place till brazed. Stays should be about 12-14mm too long to ensure they are heated easily when brazing.



# Boiler Feed Water

by Ted O'Brien

Drawings for publication by Zenon Zalewski

Over the last ten years I have noticed that a few days after a run with one of my steam locomotives, which incidentally are not and never have been absolutely steam tight, the valves and fittings begin to show a familiar green patina. The horrible fact is rainwater is acid! And it's detrimental to both steel and copper boilers.

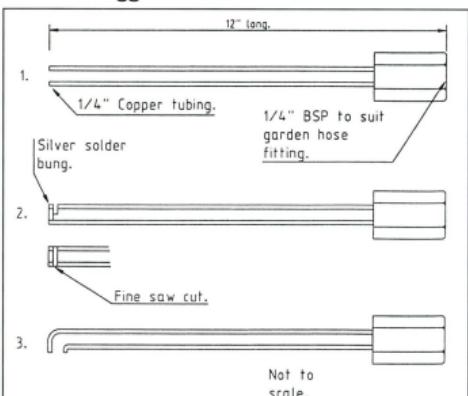
The time has come and in fact, is well overdue to examine our water supply and dose it accordingly (just like the full size locomotives).

In the later years of steam operation locomotives had a dosing tank on the tender, which dosed the water in the tender every time it was filled or topped up. The tank had a means of dosing the amount of water that was added to the tender, ie. if the tender was empty it gave a full dose,  $\frac{1}{3}$  full a  $\frac{2}{3}$  dose etc. The chemical was soda-ash and tannin. The tannin protected the interior steel surfaces of the boiler, the soda-ash increased the alkalinity or pH of the water from 10.5 to 11.00 and kept solids in suspension so that they were partially removed by blowing down at regular intervals. Sometimes as often as every hour, half a glass was blown down in 'dirty' water areas.

So much for full size. The time has come for us in the miniature field to seriously follow the full size practice. It is possibly the domain of Boiler Committees to investigate and regulate and educate operators of boilers in their care and operation. We have not had, to my knowledge, a serious boiler explosion and we do not want one either. It would not do much for our insurance premiums, which are escalating at an alarming rate, so it is imperative that we take seriously the new problem of acid rain and its affects upon our boilers.

Firstly test your water supply, whether from the tap or rain water tank. This can be done using pH papers available from a friendly chemist or high school science teacher. The pH must be adjusted to 10.5 to 11.00 pH which is fairly alkaline (the opposite to acid). Tannin can be added for the protection of steel boilers. This is not detrimental to copper boilers and is added in the ratio of 1 part to 5,000 to 10,000. With tannin it is *vital* that the correct dose be used, *more is not better* but is the cause of scale build up on horizontal surfaces namely the firebox crown and the tops of tubes and flues. Even with the correct dosage the tannin settles on

## A Suggested Boiler Washout Tool



horizontal surfaces. When the boiler is blown down at the finish of a run, it is hot/warm and the tannin settles on the firebox crown and builds up. It does not reconstitute into the fresh boiler water, so at least every year, or after 12 runs at which the boiler is blown down to empty it must be washed out (just like the full size) which was weekly in bad water districts.

The best method of boiler washout and cleaning is with a phosphoric acid based cleaner for steel boilers and citric acid for copper boilers. The phosphoric acid based cleaner is a product called *Ardrox 14+*® and used at the rate of one teaspoon per two gallons of water. The citric acid is available from the spice section at supermarkets. The procedure is to fill the boiler (with dome removed) as full as possible, light a fire in the firebox until the water is hot, not quite boiling, leave overnight and remove all washout plugs and washout the boiler in the morning.

For washing out there are three main tools, but you may wish to make your own to suit your boiler. After the phosphoric acid treatment the inside of the boiler will have the appearance of being sand blasted. The dose of phosphoric acid is very low so as not to etch or eat copper and brass fittings in the boiler.

Phosphoric acid is very corrosive to copper and copper based alloys which include brass and bronze, but if the dosage is low it will clean the boiler interior without etching the copper and bronze fittings. It is also important that all traces of the phosphoric acid be washed out of the boiler.

This washout process should be a once yearly event and I think that if you cannot be bothered to take this care you should not be operating a boiler. It is a good idea to do this clean and washout before the periodic boiler inspection. When I lived in Mt Gambier S.A. the local DLI inspector did the required boiler inspection and reported to my home club on a DLI boiler inspection sheet and my club issued the boiler certificate.

At one of the inspections the inspector arrived early on purpose to catch me doing anything naughty. The boiler was open with dome removed but not cleaned or washed out. He looked into the boiler and the dome on the bench and declared the boiler okay. When I asked how he could tell without a thorough inspection he said "I can tell by the colour of the interior of the steel surface that you have been using exactly the right amount of treatment". He then looked inside and inspected every part and declared "Okay, no corrosion" and signed the certificate after pressure testing. My dosage of tannin was one drop per gallon of water, that boiler is now eighteen years old and has no corrosion whatever.

In light of this problem of acid rain, which incidentally, is world wide and not confined to industrial areas, perhaps the AMBSC should take up this matter and inspect boilers for internal cleanliness annually, doing the pressure testing and inspection at two yearly intervals. Clubs should monitor their water supply and dose accordingly. The boiler whether it is copper or steel is only the vessel in which the water is made into steam, the water that goes into them is the same.

The dosing of tannin into steel boilers should be done on the basis of the dose to suit the amount of water required to fill the tanks or tender. It should **not** be one big slug when filling the boiler and none at all at tender filling. If perchance you forgot to dose for a tank fill, do not dose double next time, more is not better or okay.

I feel that this is a very important matter and I am sure that if anyone wants to investigate my findings they will concur. Please give this matter the attention it deserves.

# Setting Up A Model Engineer's Workshop — part 3

Story and photos by Steve Reeves

## C. Vee blocks

Used for holding and clamping round objects. Very good for drilling holes in the right places.

There are 2 sizes shown — one measures 38 x 52 x 38mm while the other measures 38 x 38 x 30. These are small size ones and a bigger set would also prove useful.

## D. Parallel bars

As the name suggests, they are a device used for holding something parallel over 2 distant points. They tend to get used for accurate setting up of jobs in my machine vice as well. This one measures 12mm x 50mm x 200mm long.

## Benches and vices

A good sturdy workbench is an absolute must. It is important that it is set at the right working height that suits your body. It must also be rigid enough that it will not move when filing, hack sawing etc. I have bolted mine to the nearest wall.

The right height to set your bench is determined by what type vice you are using. It is set up using the following method. Point your arm straight down to the ground. Move your hand up vertically so that your elbow is now pointing to the ground. You should now be able to place your elbow comfortably on top of the vice without being on tip toes.

Vices come in all shapes and sizes depending on what type of work they are required for. Personally I favour the up-right type and have 2 different sizes, each mounted on their own bench. The main one shown in **photo 23** opens out to 150mm. I have replaced the jaws with a set of my own that use no teeth, so that they do not damage the job I am working on. They also have a vertical "V" slot in one jaw and a horizontal "V" slot in the other. This enables the vice to hold round shapes. These are further enhanced with a pair of "Soft Jaws" made out of aluminium, for holding delicate work that already has a very fine finish on its surface. As you can see by the shining handle, my vice gets a lot of use!

The benches are all made of big thick planks of jarrah which



Photo 23

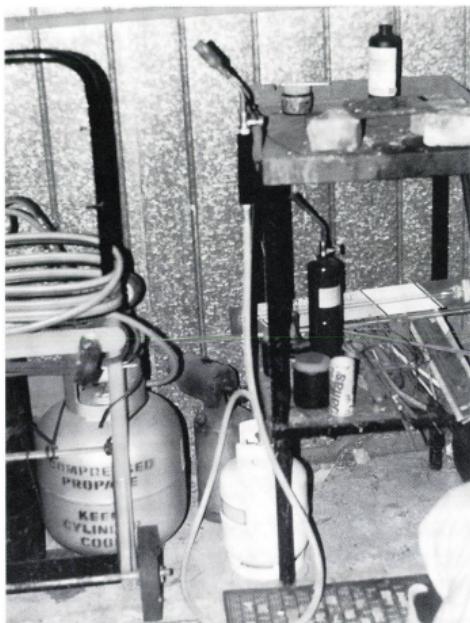


Photo 24

are connected to beefy legs. There are shelves for holding and storing toolboxes as well as other useful items of equipment. These have proven to be space saving devices and the weight adds to the sturdiness of the bench.

## Brazing bench

This is also a must, particularly if you plan to build your own copper boilers. Mine, shown in **photo 24**, started life as a stand for my drill press. It has legs made of heavy pipe section and has been fitted with a shelf. The tray has 3 sides with the front being left open, and will hold coke or firebricks as deemed appropriate.

For small work like boiler fittings, I have spaced 2 bricks and placed wire mesh over them in such a manner that a flame can pass under the work. These enables you to move the flame all around the job thus heating it evenly without distorting it.

**Tip 1** — Don't place a bright light over the work while soldering/brazing as you may not see the job heat up, overheat and melt on you. I always set the job up, flux and then turn off the bright light. Background lighting is enough to see with and I can see what temperature the job has reached.

**Tip 2** — Do not look directly at the flame as it can temporarily blind you. If you want to see how well the joint is progressing, move the flame away first.

## Brazing equipment

Traditionally the oxy/acetylene blowpipe has been the main source of heating materials. In recent years however this has become a costly way of doing things. Also it becomes unprofitable for the supplier to have you place a small order, as a set of rental bottles (which is the only way of getting them in Australia) may take up to a year or more to empty. You of course pick up the tab, so I recommend the use of LPG instead. It is said by its critics to be no good as the flame is not as hot. In practice I have found this to make no difference whatsoever.

For the blow torch, I use a 5N (2 to 3 mm) tip for general use (material up to 30mm in diameter). For copper boiler making I use a big torch which has its own neck and screws directly in to the hand piece. This torch "goes through the gas" but is beautiful for pre heating boilers of 150mm diameter and larger.

I also have a flame cutter and flame gouger for use on large heavy steel plate. For portability and very fine work, I use a small hand held unit such as a *Primus* bottle. This has three different size tips. Very good when repairs are to be done on site.

When soft soldering, I prefer to use a soldering iron which has been preheated by the smaller LPG bottle. I have two different sizes of these.

Photograph 24 shows all of these devices, while **photo 25** shows some home made tools to aid with the welding/soldering process, particularly if it's hot! Also seen are brazing goggles

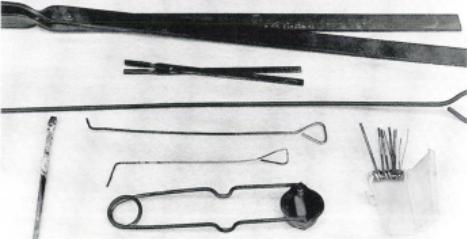


Photo 25

which must be used while brazing as the job/flame is too bright for your eyes.

## Electric welding

In the past I have shied away from using this process as I like the look of a silver soldered joint.

This reasoning is fine for small scale projects but once you move onto larger scales, particularly when steel is the more practical material to use, then the *Manual Metal Arc Welding Process*, to give it its correct name, comes into its own.

Having purchased the small unit shown in **photo 26**, the next step was a 10 week night school course on how to use it correctly. This proved to be a very practical exercise as there is a lot that goes on when you weld two things together. These are important things you need to know about. The result is thus good quality welds with the arc struck easily and a structure that is safe and strong.

There are other electric welding processes available such as the TIG and MIG processes, but the MMAW process (sometimes known as stick welding) does more than enough to suit our needs. Any specialised jobs like aluminium or stainless steel can be done by a business specialising in welding these materials.

Once you have prepared your work properly and learnt how to use your angle grinder as a file, not as a gouger, good finishes can be obtained. What's more this is a very quick and easy way of joining two pieces of material together.

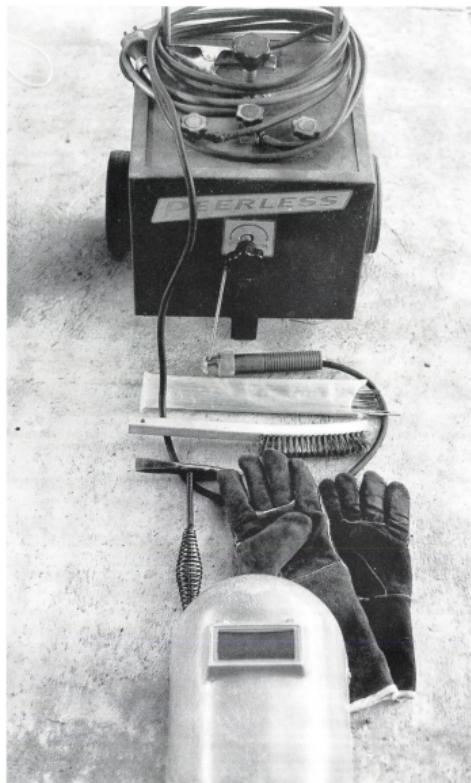


Photo 26

## Material storage

**Photo 27** shows another workbench that started life as kitchen cupboards. Underneath are shelves on which all my short lengths of flat bar, hex, round and square bar material are kept. Some people like to use pigeon holes for this with each one carefully labelled as to size and shape. I have divided the cupboard into several parts — these being brass, steel, stainless steel, silver steel, bronze and miscellaneous. Each type and size is bundled together according to their shape. By glancing and using a ruler, the right size and shape is found easily. Longer lengths of 1 metre or more are stacked against a wall in a manner that they can't fall onto someone.

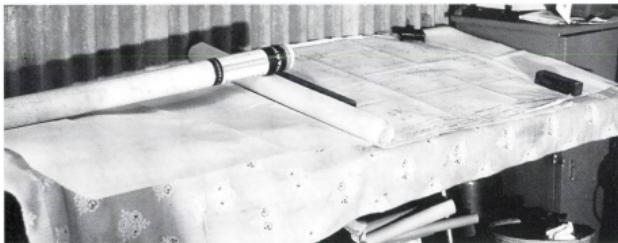
On the bench top you can find draws used for storing small items such as nuts and bolts. Also other items such as wood-screws, balls, split pins, piston packing etc. This method of material storage has proved to be very efficient in the use of space. It is easy to get at and provides yet another workbench on which to do things!

## Drawing board

While making things you will no doubt be working to a set of drawings. Whether they are commercial ones or those you have done yourself, they usually come in a big size. So I have set aside a place for these to be put on so they can be rolled out and not



**Photo 27** (above) and **Photo 28** (below)



damaged. As I make a lot of my own drawings and sketches, I decided to set up a drawing board as shown in **photo 28**. This has proved very useful and is in constant use. I now use an old blanket as a dust cover.

I still do a lot of my drawing in the comfort of the house so the main drawing equipment is kept there, with the drawings I am working from left in the workshop.

## Painting

### A. Using a brush

Very good for small jobs and any flat surface under 150 sq. mm. For very small jobs like nut/bolt heads, 3mm piping, etc, I use hobby paints — the type used by plastic kit builders. The pigments in the paint are much smaller which gives a much better overall finish. Also, because they have been designed to adhere to plastic, they hold onto other surfaces extremely well.

For general painting such as frame work, I use metal paints from the hardware store. Cheap brushes 25mm wide are used and then thrown away as soon as they become stiff. Mineral turps is used to clean them between use.

### B. Spray painting

For the larger flat surfaces where brush marks would otherwise be easily seen. This requires an air compressor with a water trap. **Photo 29** shows a sign writer's air brush and small air compressor. Soon I'll be purchasing a larger unit and spray gun similar to those used by the automotive industry.

Painting is an art of its own which if not done correctly will spoil an otherwise well made project. I suggest that you read some good books on the subject before you start.

## Workshop safety

### 1. Electrical

I have a separate feed line that goes direct from the main switchboard, on the house, to the workshop. This has its own sub board with fuses protecting the separate power and light circuits. An electrician was called in to do this installation. In addition I have found a need to run more than one appliance off the one power outlet. This has been achieved by using a commercial extension board with a built in 10 amp circuit breaker. This was bought from the local hardware store.

Drawing too much current is a very common danger. Most electric shocks occur through circuits or machines that have no current protection. When they go faulty the current will go through you instead and it is a heart stopping experience. (You can also get blood poisoning from electric shocks). Most fires are started by unseen cable which has shorted out, or has melted due to the current it was expected to carry. (Look in the newspapers the next time you hear of a house or building that has burnt down).

Electricity is a very helpful source of power but it needs to be treated with respect. Take care how you set things up. You only get one chance!

### 2. Gases/fumes

There are many fumes given off during workshop operations. The most common are those given off by soft and silver solders with their associated fluxes. You must work in a well ventilated area. I open the windows and doors, even in winter. I also use a fan to create an air flow away from me and out the door/ window. Electric welding has the addition hazard of the ultraviolet light, so eyes and naked skin need protection.

The cutting oil from machine operations is another one to look out for. So are acid fumes from your pickle bath with clean-



**Photo 29**

ing materials.

Filing produces fine dust, as does polishing with emery paper (wet and dry). With the finishing machine I have a dust mask that covers the nose and mouth while safety glasses protect the eyes.

Chemical fumes from paint, solvents and cleaning agents all are poisonous, so be careful where they are stored and how they are used. By the way, all chemicals must be stored in containers designed to carry them and must be labelled stating what they are. Using soft drink bottles, jam jars etc is a dangerous practice as people may mistake them as food.

### 3. Eye protection

Lathes, drill presses etc create swarf as they cut so safety glasses must be used here. Also never handle swarf with your bare hands. Use gloves as swarf cuts your skin just like a sharp knife does. Use a tool of some kind that will pick up the swarf for you and then move it to the rubbish bin. Note — the machine you wish to clean must be turned off before you proceed.

Sparks from grinding operations are another hazard. Most of these you can see acting as a visible reminder, but there are plenty you don't see, so watch out!

Limbs should be covered in clothing that is not loose or hanging in such a manner that it can be caught in the machinery. Avoid using short sleeves and shorts. Similarly long hair must be protected in a hair net.

Bright light from welding, brazing and soldering operations must be shielded from your eyes by goggles or a helmet. Each type of operation requires a different shade of lens. Books on the subject will tell you which ones to use. Note - *sunglasses are not good enough*.

### 4. Noise

Grinding immediately comes to mind here although the low level constant groan of a lathe or milling machine can have an effect over a long period of time. The basic rule is not to get to the point of hearing a ringing sound in your ears. Any operation you know will generate this effect means you must use earmuffs.

Note — Be considerate to your neighbours. If it's noisy for you, it's noisy for them

### 5. Sharp and hanging objects

Be careful how you store things. A piece of metal can be very sharp and if you get caught up on it, it may stick into you, piercing the skin. Similarly anything being hung from the roof must be well above the tallest person you know. Four metres or more would provide a good safety margin. If it has to be lower attach a brightly coloured sign on it.

Roof storage of materials, if not done correctly, can be very dangerous as there is no warning. It simply falls down when you least expect it.

Similarly on the floor, it must not become an obstacle course for other people (even in small workshops where space is limited). You will notice in the photographs that very little is stored on the ground. I can sweep under most things with the broom.

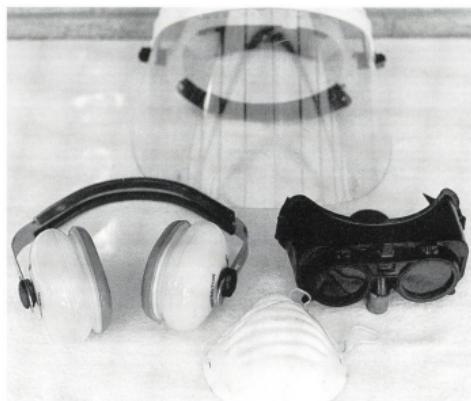
### 6. Summary

This may all sound very alarmist, but you have to be very careful. It is your visitors that face the most danger as they are not familiar with your habits.

**Photo 30** shows the safety gear that I use. Develop good habits and you will always have peace of mind.

## Workshop building

Everybody's needs are different and the size of your property will largely determine what type of workshop you have.



**Photo 30**

Some people like to use their garage, so the workshop shares space with the family car, boat or caravan. In these cases care must be taken to protect your machinery against fuel fumes, exhaust fumes and other car by products, as these will corrode metal parts.

Most workshops I have seen range from 2m x 4m to 7m square and above. They are either made of wood, fibro, tin or the occasional brick. The ideal workshop uses brick and tile which is insulated against noise and outside temperatures. Insulation is an important item despite its cost and most people do not give it any thought. Temperatures vary considerably over a 12 month period and if you use your workshop a lot, it will effect your performance and enjoyment. After all it is a hobby for your enjoyment so you should make it as pleasant as you can.

I have a separate mains power board for the lighting and power requirements. At present it is single phase only but I will be changing this to 3 phase in due course. A 15 amp power outlet has been provided for the welder.

There are several windows, partly to improve lighting and partly so that I can see outside what the world is doing around me. (Helps me not to feel claustrophobic.)

The workshop does not contain gardening tools or other family equipment. They have their own garden shed to live in. The family understand (willingly of course) that the workshop is a workshop, not a storage place

### Security and insurance

Most people do not give much thought to these two items. When they first started building up their workshops, they did not have enough gear to warrant it. Also the cost tends to put people off — "It's only a hobby", being their reasoning. However if you were to make a list of all the items you have and work out how much it is worth, you may well be in for quite a shock!

For security I have several things in place. A good locking mechanism on the main door, as recommended by an approved security company, is the first item. Security screens across the windows are the second thing used.

A custom made security system with appropriate signage has also be installed. Just as well too as not long after it was installed, it got field tested and passed with flying colours! So don't think it couldn't happen to you — it just might.

A tip given by the security agent is not to go overboard. The workshop from the outside needs to look just like any other garden shed/ garage. It will be given a passing glance by any would

be robber who will be after easier game.

Other things you can do are to mark all your tools and machines and to have a photographic record of everything in the workshop. This gives police something to work on and makes insurance claims easier. You may even find all these precautions may reduce your premiums.

For insurance you need to shop around. It is astonishing how different insurance companies quote and what conditions you are required to fulfil. You need also to state whether the workshop is for hobby purposes or professional purposes. Experience showed that this has to be proven without the shadow of doubt as it effects everything. However once this is done and the security precautions have been demonstrated, in my experience, there were no problems. In my case the policy is an extension of that used for the house. So far I have never made a claim but it gives peace of mind.

## Relations with the neighbours

Unless you live in a location that is some distance away from your neighbours, this is something you need to think about. Especially as house blocks get smaller, so houses/workshops and therefore people, are living closer together. This means that any noise, light or other activity may disturb your neighbours.

There are two simple solutions. Firstly get to know your

neighbours. We are on very good talking terms with both sides of the property. Each have visited the workshop and know what I am doing. As this is something not normally seen, the response has been very positive. Sometimes I will do the odd job for them, so adding value to the workshop for them as well as me and thus strengthening relationships further.

Secondly I choose what activity I do at what time of day. For instance grinding, hammering etc is done in the daytime, while quite jobs like filing are done late at night. You tend not to give these a second thought while you are absorbed by what you are doing. Time passes quickly so keep it in the back of your mind.

You must also understand the laws that govern the neighbourhood and the right to privacy of your neighbours. For example in my area you can not use an electric welder after 6pm at night, as this is the time people are using electricity for cooking, watching TV, etc. The uneven current draw produced by the welder will effect your neighbours. Similarly no machinery can be used after 9pm due to the noise it produces and the possible disturbance of sleep for your neighbours and/or their children. Strong odours from paints and other chemicals can be offensive to your neighbours as well.

Basically if your neighbours know you respect them and their lifestyle, they will respect yours.

## Disposal after death

I guess that this is a subject that we don't like to think about, but one day you are not going to be around and someone is going to have to face this situation. What's more, the person organising this is usually a member of the family who ready doesn't have any idea about what the workshop contains, what the tooling/ machinery actually does and what it is worth. Then there are the emotional ties that go with it. This often means disposal becomes a challenging thing to do and I have seen cases where people are taken advantage of. As there may be debts to pay off, correct disposal becomes very important. How to we go about solving this problem?

The first way is by education. When your partner or other family member takes an interest in what you are doing, invite them in. Don't shut the door on them. Yes, it is your hobby and the workshop is properly your sanctuary to release the pressures of life, unwind, etc. So it is understandable that the workshop is a personal place. However it is very important that you do this. On the whole my wife does not take a lot of interest in what I do in mine. Every now and then, however, she will come and see what the latest project is, asking "How is it going, dear?". So I show her. Believe me, this does wonders for our relationship. Going in the workshop when I wish is never an issue. She has a basic understanding of what everything is used for. This will help her when the time comes.

Secondly you can join a club or associate with a club that caters for and promotes the area of the hobby you are working in. That way when the time comes, that club's committee can recommend someone who is honest and trustworthy to advise your family on the best disposal procedures. This way your family will get a fair price without feeling they are being taken advantage of. Also the club members are a ready at hand market. After all, wouldn't you like to see the things that you have spent so much time and money on, go to good homes where they would be appreciated and used. Makes sense doesn't it?

Lastly, tell people what you would like done with things. Perhaps there are things you would like to go to a certain person. A written record of your wishes kept in the same place as your will, makes it very clear.

## GRAND JUNCTION RAILWAY (1852)

### RULES — CLERICAL

- 1 Godliness, cleanliness and reliability are the necessities of a good business.
- 2 As the firm has reduced hours of work, the clerical staff will now have to be present between the hours of 7 am and 6 pm on weekdays.
- 3 Daily prayers will be held each morning in the main office. Clerical staff will attend. Clothes will be of a sober nature; staff will not disport themselves in raiment of bright colours.
- 4 A stove is provided for the benefit of clerical staff. It is recommended that each member bring 4 lbs of coal each day in cold weather.
- 5 No member of the clerical staff may leave the room without permission. Calls of nature are permitted and staff may use the garden below the second gate.
- 6 No talking is allowed during work hours.
- 7 The craving for tobacco or spirit is a human weakness and is forbidden.
- 8 Now that the hours have been drastically reduced the taking of food is allowed between 11.30 a.m. and noon, but work will not on any account cease.

I have included this subject as I have witnessed several times now how these things effect those that remain. It can be very hard and hurtful to all family members, particularly your partner, and close friends as well. For these people there is the letting go. Second there are the people who want to take advantage of the situation for their own gain. Then there are the disputes between family members/ friends over who should have what and why. I have seen for instance a very well made engine, having been fought over, end up as a child's toy. It was seen being pulled along by string through sand by the builders grandson. Somewhere along the line the builder's daughter missed the point. But was she ever educated on the subject to begin with?

Are these the sort of things you want to see happen? Personally I don't. I have done something about it.

## Alternative workshops

Building a workshop takes time and money. The time it takes to get this together may slow down your current project, or it may be progressing in intermittent bursts. One-off jobs may be too big for the tooling you have. After finishing this project you may decide to move onto another area all together. In these cases you may decide that you do not want to set up a workshop. So what alternatives are available?

Night school classes are a good start. As well as the machinery at hand, you have a trained instructor who will show you the correct way of doing things. In my early days many of us went to a night school class once a week. This proved very valuable, as well as a good social outlet. It was also an extension of my workshop where I could do things with machinery I didn't have. For example, gear cutting for my traction engine was done here. Specific courses are run to provide the basic skills. There are also classes available which cater especially for our hobby.

Gaining access to a college's workshop is another method. Some people will allow other people to use their workshop on a regular basis. Most Saturday mornings there are several people over at mine. At time of writing their ages range from 14 years to 25 plus. This I find a most enjoyable and rewarding aspect to the hobby. It is a good way of passing the knowledge onto the next generation. If your project has components that are too large for your tooling someone else's workshop may have what you need. Similarly you may have tooling in your workshop that could be of help to others. So short duration sessions in others workshops help get over this problems.

Another source is the professional engineering workshop. Perhaps this is the place of your employment or if you get to know the owner well, you may get access at specified times. I know of many model engineering projects that get built this way.

Tip — If you get the chance to work with a professional, do so. A skilled professional is a craft person (look for the ones that love their job, or take great pride in what they do). They know the right tools for the right job. They know how to use them correctly. Not only that, they know the quickest way to make something, which teaches you how to save hours and hours of time, all with

the correct finish and accuracy. I learn a lot from the ones I know and they like the fact that I take an interest in what they do. I always show I appreciate their time and effort.

Don't be afraid to ask someone for help. There is always someone who wants to help. Conversely open the door to others. You may feel that you are not the teacher type or know special skills, but remember that once you didn't know how to do anything at all, yet you still got where you are today. So there is always a way you can help. You may even be surprised at what rewards you get out of it!

## Books and magazines

Another word for these is reference material. These are just as important as your lathe or any other item in your workshop. It is here that better ways of doing things can be found. My collection is extensive and in constant use. I subscribe to three magazines, one of which I write for. Thus I have a ready at hand pool of resources which better enhances my ability in my hobby.

Videos are another source as the live action is two dimensional giving both sight and sound and thus adding another dimension to the equation.

No doubt in the future computers will be doing the same thing. They are already influencing the way we work, eat, rest and play.

## Epilogue

This has been a comprehensive study of setting up a workshop with a few topics covered that might not seem related. It will however give you a good idea how this type of hobby works, what you can get out of it, and what you need to do. Good luck with your new endeavour and I hope it brings you many hours of enjoyment.



## Lathe Packers

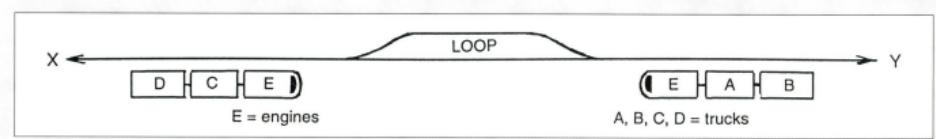
Sometimes getting the right centre height for your lathe tool is a problem. I keep a small rack of packing, ranging from .015" in steps to 1/4" thick.

Max Rendell



## A Shunting Problem — The Solution

**EAB** runs through the loop leaving **B** in the loop. **EA** continues onto the main line and then backs towards **Y**, followed by **ECD**. **ECD** backs through the loop, pushing **B** towards **X**. **EA** moves into the loop. **ECD** departs for **Y**, leaving **B** at **X**. **EA** runs off loop, picks up **B**, backs through the loop leaving **B** in the loop. **EA** then picks up **B** from the other end of the loop and departs for **X**. Stan Allison



# Thames Small Gauge Railway Society — Official Opening

by Paul Milner

In 1898 a railway branchline to Thames was opened, beginning a long and historical association between the town and the railways which would span a century. This was strengthened when A & G Price, who for twenty five years had been producing logging, mining and agricultural equipment at their foundry in the town began building railway locomotives. Over a period of 75 years they produced a wide variety of steam and diesel locomotives for industry and for the New Zealand Government Railways. NZR closed their branchline in the early 1990s and the track was lifted, leaving Thames without trains.

Now, one hundred years after the original branchline opened, we were being invited to the opening of a new railway in Thames, this time a dual gauge of 5" and 7 1/4" and it has been built with pride by the members of the Thames Small Gauge Railway Society.

The Thames SGRS was established in May 1994 and soon after, gained permission to place a temporary oval track on the Brown Street reserve. The temporary track was 137m long with a passing loop and spur to load and unload locomotives. A visit to the track in the early days was a pleasant experience and when visiting on one such occasion we were warmly entertained with tea from a flask and cakes on a small table inside the track circuit. Seated on garden chairs, we chatted and watched as the trains ran past, the same trains and at very frequent intervals, and never did they run out of view!

Following some extensive fund raising the building of a station was commenced

in 1996. The local council stipulated that the building must be in keeping with the turn of the century colonial style of this old gold mining township, so plans were drawn up based on railway architecture of the time to produce a new building which blends well, in style, with the surroundings.

Over a twelve month period the fifteen active members, with support from local firms and tradesmen, put in an amazing amount of effort, managing to complete the station to a very high standard. By the end of 1996 the original temporary track was still in regular use but was now some distance away from the new station so urgent attention was next put to track laying.

When the new year started in 1997 spirits were high, the track laying was going well and the summer months lay ahead. The weather was a bit changeable but the group looked forward to a good season of concerted extension work. But it was not to be. On January 11, Cyclone



Thames Mayor, Alasdair Thompson, cuts the ribbon Photo: S Burton

Drena hit with full force and devastating results, causing major flooding in Thames and the surrounding areas. What a discouraging sight met the railway builders when they inspected in daylight. The storm, coupled with a high tide, swamped the area and submerged it, scouring the track. Worse still, sandbagging had been undertaken by the council as an emergency measure against the next tide and the track was lost under water, bags and mud.

At this point the club temporarily lost 'possession' of most of the site and for six months the council worked on a permanent bund along the entire length of the foreshore to protect the township from further flood damage. Railway work continued where possible during this time and eventually the steaming bays were constructed and also a hydraulically operated lift/turntable was installed to allow locomotives to be unloaded from vehicles of any height onto the track or bays.

When attention turned to the track again the alignment had to be altered because of the change in the terrain but it allowed some elevation to be brought into the design by actually using the top of the flood bund.

The permanent track was commenced at the station to head south towards the original temporary circuit and took the form of two parallel tracks to intersect the existing 'oval' and turn it into a loop. A point of interest was formed when it was



This is how the station looked after Cyclone Drena passed

Photo: Steve James

decided to cross the two tracks about thirty metres out from the three road station. This meant that a train leaving south from the station would clear the points, progress a short distance and then cross the return line eventually traversing the return loop in an anticlockwise direction. By Christmas 1997 the southern end of the track had been laid forming half a 'dog bone' and this 600 metres was soon in use and earning much needed revenue.

The Society as yet has no club locomotive and relies on members' locos for running, which is done every Sunday. Owing to the quantity of 4-wheel battery/electric locomotives resident at Thames, trains at that time ran with a loco at each end which removed the requirement for turning the whole train between runs and thus sped up the next journey.

The first three months of 1998 saw renewed activity and the northern loop of 300 metres was completed. The route of this part of the line was rather restricted as a high-fenced tennis court lay almost in line with the new track path. Because of this the track leaves the station heading north and climbs a short, steep gradient to the top of the bund and progresses past the tennis court to an open park beyond. Here there is a 180 degree turn to the right returning to the station alongside and about two metres from the tennis court. From this direction the facing points lead to the steaming/loading bays.

### The big weekend arrives

Locomotives and owners began arriving on Friday afternoon and by the evening there were about a dozen set by for the night. It was a particularly cold night by the sea and the temperature kept the night watchers close to the brazier which was standing in the steaming bay area. A few people slept in or around the station for security and I expect those in the tent were glad when the sun began to warm them on Saturday morning.

Most of the local members were on site from about 7:00am on Saturday welcome and assist the visitors. The facilities at the

track had been extended to handle the extra locomotives and a temporary elevated siding was also available for steam raising. Saturday morning was alive by 7:00 with vehicles unloading, drivers familiarising themselves with this new track and spectators from the adjoining shopping mall. Many warm re-acquaintances were made by visitors from clubs in all parts of the North Island. By 10:30 there was quite a festival atmosphere, enhanced greatly by the local citizens' brass band as trains assembled in the station for the opening at 11:00. It was an interesting and unusual sight to see both station roads filled with trains and many others held on the approach from the northern end.

The weather, always unpredictable, had been cool and overcast but as 11:00 arrived the sun paid a welcome visit to inspect and warm the scene. The brass band played, the speeches were made and the Mayor cut the ribbon to release the procession of some thirty trains which made their way around the circuit. The leading train was *Ratu* a four-wheeled battery electric, carrying the Mayor, his wife and club President Steve James. The following trains carried invited dignitaries who had played an important role during the formation of the club. It was rather pleasant being a part of this occasion and as the trains made their way around there was much waving and an opportunity to spot someone else that hadn't been seen for a long time, albeit fleetingly. As the cavalcade began to meet itself at the diamond outside the station progress was naturally slowed but it gave opportunity for interested conversation with bystanders and passengers alike.

A train making the circuit passes through the station again half way through the ride. This proved to be an interesting asset as at that point the line is edged on its farthest side by a metre high retaining wall, and the side closest to the platform is lightly fenced to avoid people straying into the path of trains. The bonus is that from the station area passengers are able to observe



Eric Burns from Manukau Live Steamers with his Sinclair built 2-6-2 Photo: P Milner

at close hand the moving sight and sound of steam trains travelling at a reasonable speed as they approach a short steep climb just north of the station.

It was a most enjoyable weekend, hospitality was most generous and the new trackwork performed very well, becoming 'fine tuned' during the day. By the afternoon 'tweaking' had become necessary, being a normal feature of a new track, and as was commented by Steve James after the event, it was felt that it had all been to the improvement of the running. The catering was excellent and must have been a continuous task for the volunteers in the adjoining squash club kitchen.

Thames club members were delighted at the number of visitors and locomotives and at the close of the weekend were in the happy position of having received sufficient takings to help offset some of the costs of arranging a weekend like this.



Roy Sharman with a light load for his 2-4-4-2 Mallet Photo: P Milner



The trains lined up waiting for the big moment. Photo: S Burton

# Copper Tubes in Steel Boilers

by Ted Crawford

Included in a "help yourself" pile of books at the local library were several on marine engineering including *Questions and Solutions in Practical Mathematics, First Class*. One question which seemed particularly interesting related to the differential expansions of steel and copper in an assembly which, with a little imagination, could be seen as the possible situation inside a steel boiler with copper fire tubes.

The solution of the question was concerned with the resulting expansion of the combination of mixed metals but the intermediate steps showed that the resulting forces generated could be calculated using similar methods. The results for a boiler such as my own were quite surprising and the calculations using the dimensions of that boiler will be given in a form which hopefully will be easy to follow.

## First, some explanations

Every ordinary metal behaves to some extent like a block of rubber if formed into a cube and pressed between opposite faces it will be compressed elastically. The ratio of the force applied to the degree of compression is referred to as the Modulus of Elasticity or sometimes as Young's Modulus. The obvious difference from rubber is that the required force to alter the size is vastly greater for metal. To alter copper by one thousandth in one inch needs a force of 15,000 psi and steel needs 29,000 psi. Text books quote M for steel as 29,000,000 and M for copper as 15,000,000 which is the same as 29,000 or 15,000 psi per thou. (per inch). A compressive force *decreases* and a tensile force *increases* the length.

When metal is heated it expands in all directions if not confined. The co-efficient of expansion for steel is 0.5 parts per million per 1° F. and is 0.95 parts per million per 1° F. for copper. The temperature of steam at 100 psi is 337° F. or 267 degrees above an ambient temperature of 70° F. An inch of steel subject to that temperature change will, if free, expand by 267 x 6.5 millions of an inch or 1.736 thou. and an inch of copper will expand by 2.536 thou.

But if the ends of the two metals are fastened together the expansion of the copper is restricted by the steel which is itself stretched by the copper. The situation can be illustrated by an assembly of three springs between two bars where, before assembly the centre spring representing the copper tubes is longer because of copper's greater expansion with heat. The outer springs representing the steel barrel have to

be stretched to attach to the bars and in doing so will compress the centre spring. The final bar spacing depends upon the relative strength or the *modulus* of the springs. It is clear that the spacing self-adjusts so that the force from the centre spring equals the force from the outer springs.

## Calculations

Using the same principles and a bit of algebra, the forces generated inside a boiler can be calculated. The term "strain" used in these circumstances is the forced change in length from what would be the relaxed state.

### Boiler data taken from the boiler in LISS

Barrel: OD 6" and wall thickness 1/4"

Tube plates: 3/8" thick spaced at 11 1/2"

Fire tubes: 10 off 3/4" OD, 16 swg copper.

### A close approximation to the area of the cross sections is given by:-

Barrel:  $\pi \times (6 - 1/4) \times 1/4 = 4.52$  sq. ins.

Copper tubes:  $10 \times \pi \times (3/4 - 0.064) \times 0.064 = 1.38$  sq. ins

### Calculations for a temp. rise of 267° F.-

Free expansion copper per in = 2.536 thou.  
Free expansion steel per in = 1.736 thou.

Let E = the actual expansion per inch, the same for both as they are fixed together at the tube plates. Then the copper compressed strain is (2.536 - E) thou. per inch length. The steel stretched strain is (E - 1.736) thou. per inch length.

The total force on the steel barrel is the same magnitude as the total force on the copper tubes but note that one is a tensile force and the other a compressive force.

The formula is (Total force/cross sectional area) divided by the stretched or compressed strain per inch, whichever is appropriate, equals the appropriate Modulus for the metal.

### Re-arrangement of the formula gives

Total force = M x area x strain, therefore:

For the **steel** Total force = 29,000,000 x 4.52 x (E - 1.736)

For the **copper** Total force = 15,000,000 x 1.38 x (2.536 - E)

These forces are equal in magnitude as already explained so that:

29,000,000 x 4.52 x (E - 1.736) = 15,000,000 x 1.38 x (2.536 - E)

Cancel out the 1,000,000s and re-arranging gives: (131.1 + 20.7)E = (227.6 + 52.49)

$$E = 280.09 / 151.8 = 1.845 \text{ thou.}$$

**This is the actual expansion per inch length of both steel and copper greater than steel alone and less than copper alone.**

Putting this value for E in either of the

total force formulae and allowing for the strain expressed in thou., give 14300 lbs total force.

This is the force on the tube plates which is in addition to the steam pressure force.

The steam pressure force is given by the steam psi x the area of the tube plate exposed to the steam. This excludes the fire tube area. For LISS the area is  $\pi/4 \times 5.52 - 10 \times \pi/4 \times .752$  which equals 19.34 sq. ins. Multiply this by 100 psi gives a steam force of 1934 lbs on the tube plate. This is dwarfed by the expansive force of 14300 lbs!

## Effects on metal

Do the tubes slide in the tube plate and relieve the pressure?

It is generally known that at a metal boundary at microscopic level there is no such thing as a smooth surface. This means that if the tubes are well expanded into the tube plate the irregularities result in a type of weld. The area in contact is  $10 \times \pi \times 3/8 \times 3/8$  or 8.8 sq ins. This could be multiplied by the Fractal factor which results from all the microscopic irregularities! Leaving that aside, the shear force for copper is 33,000 lbs per sq. in. or to break the bond of the ten tubes a force of 291,579 lbs would be needed. Even 10th of this is still well in excess of 14300 lbs.

A practical test was done in this way. An 11 1/2" length of the fire tube material was expanded by the same means as used in the boiler, into 3/8" steel ends which had been welded to side bars made out of 1" x 1/2" railway line. The whole lot was put in the domestic oven and warmed up to the limit and examined for signs of movement of the copper. There was no sign of any movement. A flame was then used to heat up the copper tube. When it was very hot there was a crack as an expanded joint suddenly gave way. This indicated that it is unlikely that the tubes in the boiler which were similarly expanded into the tube plates are moving under steam.

## Conclusion

Where does this leave my boiler with 16234 lbs force on the tube plate which is restrained by 17.2" of weld on its circumference? This amounts to only 939 lbs per inch of weld which has a probable shear strength of 18,000 lbs per inch in a thickness of 3/8" and so there is a generous factor of safety.

A thinner tube plate would bulge slightly in the centre to relieve some of the pressure from the tubes. A movement of 5 thou. at each end of the boiler would be enough.

# Running Scale Trains on the GVR

Story and photos by Warren Williams

Hornsby Model Engineers have now held two scale running days on the Galston Valley Railway. The concept of Scale/Time Table Running (i.e. hauling scale rolling stock) was initiated in England and led to the formation of the GL5 (Ground Level 5" gauge Assoc.). Through Reg Watters' interest in the English idea (and as anyone who knows Reg and his collection of rolling stock) he was eager to see this idea take on in Australia.



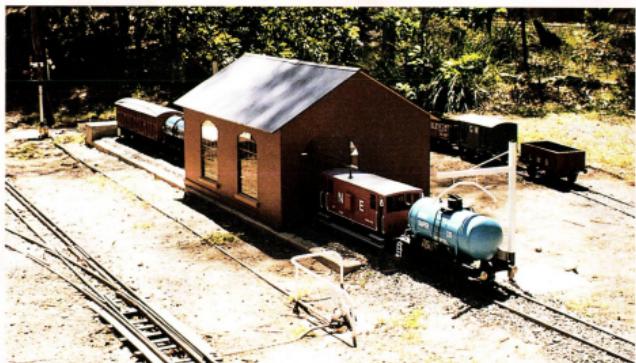
*No, not an accident, just the GVR team unloading and sorting rolling stock ready for the run*

Discussions among interested fellow Hornsby members saw the interest grow to the stage where the decision was taken to have a go. To John Knights fell the task of compiling a time table to suit the G.V.R. track and layout. The runs to date have been to two completely different timetables. It is no easy task with the constraints (for scale running) built into the club's track. (As yet no one has offered to take over John's task). Ideas for different train movements are passed on to him for possible inclusion at a later date.

There are many requirements for this



*Reminiscent of an era which is now part of history, John Wood's 73 classes heads a typical short freight on the branchline*



*Above: The milk siding is a fairly busy place when there are milk tanks to empty and wagons to load. Below: In Galston yard, John Wood's 7306 and Craig Hill's 3805 await their next turn of duty.*



type of running. These include locomotives, passenger stock, freight stock, drivers, signallers etc. and plenty of bodies on the ground to make the whole show go. And of course numerous clocks spaced around the track at strategic locations for instant reference.

Once the run begins it requires full participation and interest to maintain arrivals and departures on time. There can



Charlie and Mark Stapleton's 56-501 and Ed Curry's Speedy (above) have everything under control in Galston yard, while out in the bush (left), Bryan Harris' Railmotor 404 is coming off the branchline at Hilltop.



be little time for small talk etc. and that can wait till the post-run tea break. To keep the correct image and size relationship all rolling stock is to  $1\frac{1}{16}$ " and  $1\frac{1}{8}$ " the foot scale.

Interested persons can contact the Secretary for more details of proposed running days.

Those interested in being involved are welcome, those with locomotives and or rolling stock may care to list their availability for future runs. As it would not be possible to satisfy all on any one day, names, locomotives and rolling would be placed on a register so that in time all would get a run eventually. Maybe the interest may spread to other clubs here's hoping.

Sounds like fun doesn't it?  
What has your club been up to?

#### Why not share it with us all.

Send your club news to AME at  
PO Box 21 Higgins Act 2615

## A Simple Tube Bender

by Ed Murrell

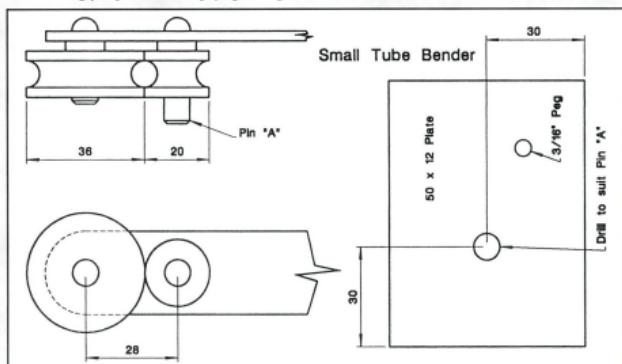
*Drawing for publication by Greg Young*

Small copper tubes can be curved with the fingers, but to get a neat and precise curve with a small radius is difficult, and to get several the same is very hard to do.

The bender is a simple project not involving a lot of time to make, and well worth the effort.

The idea of the different size rollers gives a choice of radius. The first roller is made and parted off. The second one can be checked before parting off by placing the first roller on the long pin of the lever and then the fit of the rollers together and the fit of the tube in the groove can be checked.

I have rollers for  $3/16$ " and  $1/4$ " tube and I am sure it would handle  $5/16$ "



# The SMEE Centenary Exhibition

## (Just part of a steam lover's trip to the UK)

By Geoff Payne

Photographs by Ryan Payne

I've been staring at this computer screen for what seems like an eternity, wondering what would my fellow model engineers like to read about at the SMEE Exhibition held recently in London at Brunel University, Uxbridge. As I think thoughts flash through my head of the experience of walking into places that I've only read about in books. I think of the sight of all of those full size steam and diesel locomotives assembled in York Railway Museum's great hall. For the price of a ticket being able to step back in time to see Mallard, The Rocket, Evening Star, Tasmania's Garratt, Great Western locos, LNER locos, or was it the atmosphere of the loco repair workshops, or the platforms lined with Black Fives, Gresleys, Halls, Manors, Stirling Singles, Royal Trains, etc. Wow, what a sight to see. If only I could be let loose with a ton of coal, a match and a deserted track for a few hours. Is there any one looking? Yeah. Oh well, back to our tour.

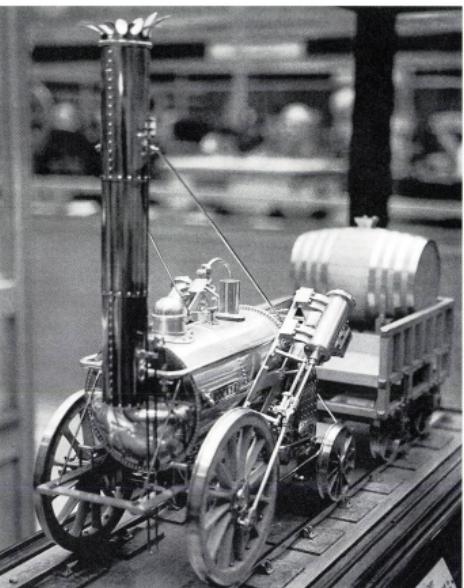
### The tour in brief

My wife, Jude and I were starting on the trip of a lifetime throughout England, Scotland, Wales and Ireland and the journey, which we were to undertake, was to be over 2500 miles in a hire car and the sights and experiences will stay with us forever. It all started as a lost in London experience, then up the A1 to Cambridge for a bit of education in travelling in a little car at 80 mph and driving on the crowded roads, fantastic weather, and then from

Cambridge up to the Neen Valley Railway which was unfortunately not open. That was however not to stop me seeing all of the locomotives parked around the station and I believe that *Thomas the Tank Engine* was around some where? I couldn't find it.

From there we went up to Whitby (of Captain Cook fame), stayed the night in a Y H A hostel which was an Abbey overlooking the town. From Whitby we travelled across the Yorkshire moors to the Lakes district and straight into the Windermere steam boat museum where there must have been 50 preserved working steam boats of all shapes and lengths. The Lakes District left behind we now journeyed to Scotland and all of its historic sights. After hearing 230 bagpipes playing at the Edinburgh Tattoo, I can now understand why the

Scots were renowned as fierce fighters in battle. With the sound of all of those bagpipes behind me, I would fight any foe also.



A closer look at the silver Rocket, built in 1932 by Dr J Bradbury Winter, and which took between 12,000 and 15,000 hours to build.



The basketball court area was full of stands and displays. Note the silver Rocket in the case.

### 30th Great Dorset Steam Fair

From Scotland, through wonderful Wales to Cornwall and on to Dorset, where the 30th Great Dorset Steam Fair was being held on a farm of 220 acres. When we arrived it was wall to wall activities of model traction engines, full size traction engines, fair ground engines, crafts, second hand machinery, rides, and everything a scrounger could dream about in his life. Yes, for an Australian model engineer, it was like being in heaven. There was every thing your life desired. I wanted one of those engines, ten of those milling cutters, and yes I would love one of those full sized wonderful polished traction engines, a few vintage cars, and throw in a few vintage motor bikes to play with at home. "Well", Jude said "What about the exchange rate?" Our Aussie dollar was



An interesting assortment of working scale signals

the lowest in history, so I had to put everything back, and I didn't know how I was going to carry it all in my port anyway. If any of you readers are planning to go on a trip to England, I thoroughly recommend The Great Dorset Steam Fair. I stood in front of approximately 30 plus steam fairground and traction engines lined up in a row with their chimneys pouring out the most beautiful smoke into the clean dusty country air. Talk about smoke pollution, loved it! I was starting to feel that I had died and gone to heaven. The sight of 220 acres of steam driven equipment, all belching smoke, and smell and working, is a sight any steam buff will carry for the rest of his life. We wanted to camp in the grounds, but unfortunately someone in their wisdom put the SMEE Exhibition and the Great Dorset Steam Fair on over the same four days and I wanted to be in two places at once, so off to London to visit the SMEE Model Exhibition, arriving back in Enfield, North London about 10 pm.

## The SMEE Centenary Exhibition

Next day, up we get and off to SMEE. Barry Glover had phoned my son, Ryan, in London to ask if I would represent the Australian Model Engineers after explaining to my son about the sad passing of Ken Tinkler and that his son Graham, was to return to Australia before the Exhibition. Naturally, I would do what I could and off

Ryan and I went to see the models at the B r u n e l

University in Uxbridge on the west side of London, about 1.5 hours drive, if in luck with traffic around the M25. After parking the car and following the signs we entered the exhibition which was held in the gymnasium building at the university. We purchased our tickets and received the

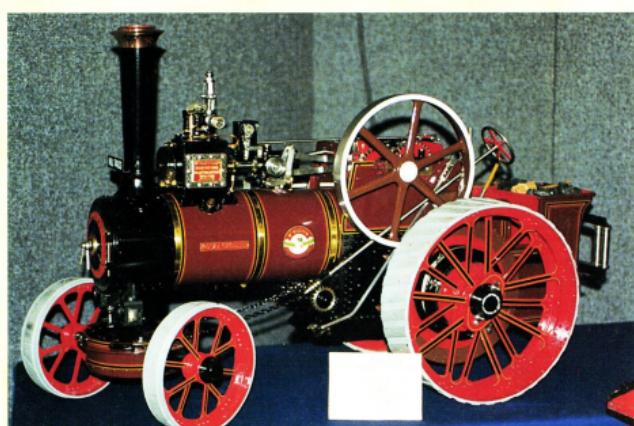


This fine 2-2-2 (above), builder unknown, and Clayton & Shuttleworth by David Casely (below) are typical of the standard of models on display



S.M.E.E. exhibition program, walked down the entrance hallway up the steps and without uttering "Open Sesame," entered Aladdin's cave for model engineers.

On the floor below was one of the most spectacular displays of the modellers art and products that I have ever seen in



Unfortunately the name of the builder of this fine Allchin Royal Chester was not recorded.



*Stuart Turner Beam Engine by Peter Hermann*

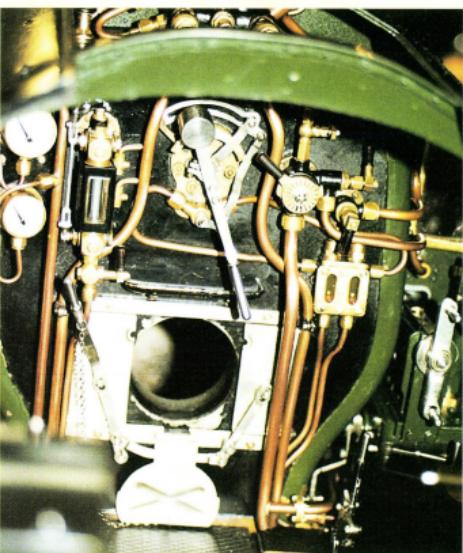
one place. From my elevated vantage point, I could see Tracy Tools Ltd., Myford Ltd., A J Reeves & Co. Ltd., Warren Machine Tools Ltd., Southern Federation of Societies, Nexus Media Ltd., and many more too numerous to list here. I couldn't wait to get my eyes on that lot, so off I went, and after giving Ryan the task of photographing as much as he could to give model engineers back home a chance to share this experience, and for the first hour or so, I darted around trying to absorb as much as I could and collect the various pamphlets and magazines on offer.

In the first hall, the basketball court, there were so many stands and models on display that I don't think I could describe in words. I was so thoroughly absorbed that it was a complete surprise to see, there was more in another room and then more and more. I talked to the people on every stand and gathered as much information as I could. There was a 7 $\frac{1}{4}$  gauge Evening Star which was built by Ron Martin and is now owned by Phillip Bellamy who is a Swiss gentleman. The locomotive is kept in London and its owner travels across a couple of times

each year from Switzerland to drive his beautifully built machine. At the same stand alongside was a beautifully built model of Australian history in a 5" gauge AD 60 Beyer Garrett. Although this model was partly built, the detail was incredible.

At the Southern Federation of Rail Societies' stand, the presence of Australia was apparent in the various club badges of all of our societies, kindly collected and donated by Barry Glover. There was also Barry Glover's photograph (*bet that gave you a start ... Ed*) and for a

*In the grounds outside, people were able to ride on a 7 $\frac{1}{4}$  gauge railway. Note the scale profile rail.*



*Above and below: some of the detail on Philip Bellamy's 7 $\frac{1}{4}$  gauge Evening Star, built by Ron Martin*



moment, I really thought I was back home in Australia. The Southern Federation of Societies has a high regard for the work done by the AALS in Australia and any modeller visiting that stand would have been made

very welcome. On the Winsor Model Technology Ltd. stand, there were beautiful locomotive kits available and for those people who did not wish to purchase the machinery and tools necessary to construct a model locomotive from scratch, this must surely be a very cost saving way to enter our marvellous hobby. The kits were in 5" gauge and were well constructed and came in stages for you to assemble and you could pay in eighteen or twelve monthly instalments respectively as you progressed with building. Every kit is designed for straight-forward bolt together assembly with absolutely no machining

required. What a way to build a locomotive, and get involved in the hobby, especially if you do not possess any lathes, milling machines, hand tools etc, and the costs saving to the builder. To give a sample of costs, the kit for a 5" gauge Britannia locomotive in the pamphlet I brought back was UK 7245.06 pounds including van and carriage in the UK and for a 5" gauge Great Western class '14XX' Class the costs were a total of UK3997.35

pounds with the same conditions as the Britannia.

There were squash courts packed with internal combustion engines of all types, hot air engines, model locomotives both steam diesel and electric, workshop equipment, stationary engines, model boats, traction engines, trucks, clocks, tools, gas turbines, etc. Whilst the visitors were inspecting the indoor exhibitions in the large halls and squash courts, outside in the grounds

were the working 7 1/4" locomotives and traction engines.

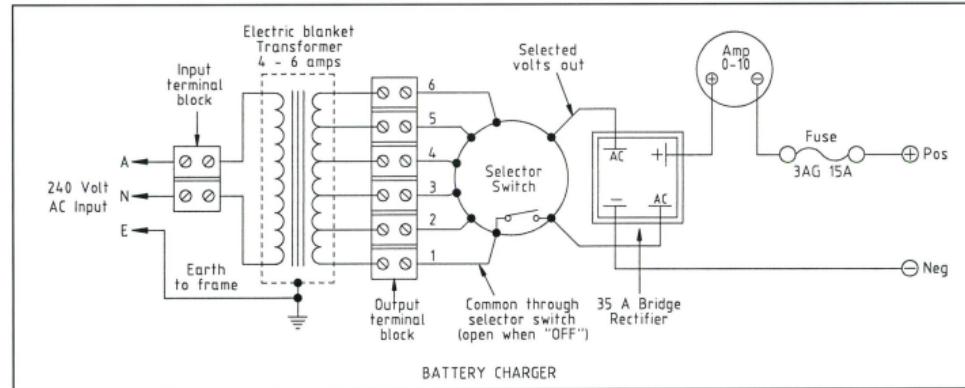
I honestly don't know how to describe all of the S.M.E.E. Exhibition, but it certainly was the best collection of the modeller's art that I have seen. I will leave it to the photos give a small sample of what was on show.



# Make Your Own Battery Charger

by Alf Harder

Drawing for publication by Jim Gray



## Parts required

**Transformer:** Old electric blanket type (2 types — 3 amp and 6 amp). Type will decide final output. These transformers are robust and can operate approximately 30% above design output. (I have operated this type for about 15 years with no problems).

**Selector switch:** This is also part of the electric blanket controller. Remove the indicator lamp, unsolder all the wires, keep mount bracket for remount as charger voltage selector.

**Terminal strips:** A 6-position terminal strip mounted on top of the transformer to take "common" output wire and 5 voltage wires. A 2-position terminal strip to connect 240V input also mounted on the transformer.

**Ammeter:** 0 to 10 amp is ideal. The nearest is Dick Smith type 0 - 20 amps.

**Fuse holder and fuse:** A holder 3AG size, open type to take "glass" 3AG 15 amp fuse. This is to protect the system from high output, and will also 'blow' if the battery is connected in reverse.

**Bridge rectifier:** This converts AC power from the transformer to DC to charge the battery. 35 amp is used and a heat sink

## Terminal Block Connections

1	Common approx. Volts AC	0
2	Min .....	1
3	Low .....	14
4	Med .....	18
5	Hi .....	22
6	Max .....	32

plate under the base to dissipate heat.

**Base:** A piece of 6mm ply wood approximately 150 x 200mm.

**Cable:** AC supply, 3-core with plug. DC output, 2-core heavy duty. Alligator clips on each wire, one painted RED for positive (+) and one BLACK for negative (-).

## Notes

- Ensure 240 volt supply to transformer is isolated for protection.
- Bridge rectifier to be mounted on a post with heat sink material between base and post to dissipate heat (this does get hot!).
- Mount fuse holder on post as solder points are on the underside.

## Operation

- With selector switch in "OFF" position, connect RED clip to the battery positive and connect the BLACK clip to negative.

- Select "low" position and observe amp meter reading — this will vary depending on battery charge condition.
- Select switch position to read 4 or 8 amps (depending on type of transformer).

## Protection

If battery is not monitored, run the supply power through a timer set for about 2 hours, as the battery could overheat. This is not a constant current charger and will alter as the battery becomes charged. Amps will drop off. If the amps supply to the battery is approx. The design output of the transformer, there will be no problems.

## Cost

Parts purchased from a Dick Smith store were:

Terminal strip	(P4855)	\$2.00
Ampmeter 0-20Amp*	(Q2036)	20.00
Fuse holder 3AG	(P7908)	1.00
Bridge/rectifier 35Amp	(Z3336)	7.00

*This short article is reproduced with permission from the Tullamarine Live Steam Society newsletter Soot & Smoke.*



# A New Track in Jerilderie

Story and photos by Gary Fuller

Jerilderie's newest railway line is close to being operational.

With over 800 metres of  $7\frac{1}{4}$ " gauge track already laid as well as stations and carriage sheds close to being finished, the Jerilderie Steam-Rail and Heritage Club is hoping to be carrying passengers within the next two months.

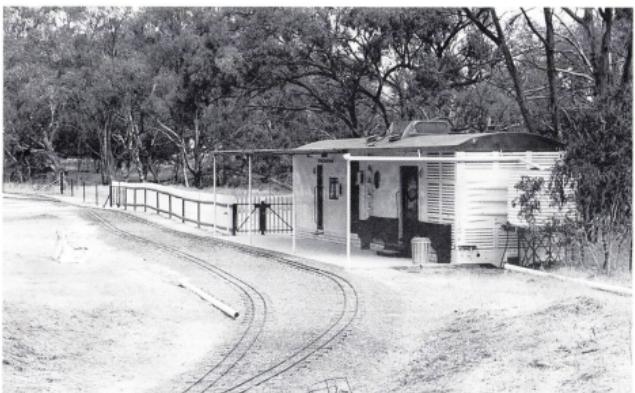
The track is located in natural bushland right in the heart of the town. Well over half the track is bordered by The Billabong creek, making for a very picturesque journey. Even though our area is renowned for its flatness, the track has some very interesting climbs as it winds its way through the bushland.

The main station is a completely revamped guards van, donated to the club by one of our local properties. The station's seating is from the original Jerilderie Station, and well over 100 years old. A second station is to be built near the amenities block, which is located on a large grassed area, very suitable for craft days.

The total area of the Rail Park is approx 15 acres, which will allow plenty of room for future expansion, including a separate 5" gauge track. When the first stage of the track is completed, it will be over one kilometre long and will feature a trestle bridge, tunnel, banked cutting and have lovely views of our creek.

Club members have one steam engine with two diesel engines being completed. More engines would be most welcome. Should anyone require further information, the club can be contacted C/- Secretary (Gary Fuller), 64 Jerilderie Street, Jerilderie NSW 2716. Ph (03) 5886 1400.

*The photos show some of the trackwork, the site and finally the ex guards van station.*



# Club Roundup

compiled by Neil Graham

## Auckland NZ

### Auckland Society of Model Engineers

Security of the clubroom doors has been improved. Visits were made to four local firms to satisfy the model engineering minds. The pedestrian track underpass requires work to upgrade same. It has been suggested that all iron work be galvanised, the side rails be pinned and that height restriction boards of the rubber curtain type be placed in the appropriate locations around the track. Also that the steaming bay area be fenced to restrict public access.

Bits and pieces nights remain popular, the offerings vary from little oscillators to parts for a 3" scale road roller.

#### Scale Marine Modellers

The October competition day consisted of mercantile steering and tug work. The courses remained the same for both events and it was a big course. No one finished with a clear round! New marker buoys were trialed which are coloured above the waterline and can be seen from anywhere around the pond.

The November club night saw some nice equipment tabled. Some (but not all) were:- Nobby Clark's *Esmeralda*, a 1920's cargo/passenger ship, ply built with twin 380 motors. Eddie Giles 2000 tons *Hudson Bay* collier, the prototype on which he served. The model was built from one photo and memory! Phil Isaacs golf trolley was purchased for next to nothing and he converted it to carrying boats! Martin Jones showed some electronic speed controllers that had been repaired. They failed due to no fuse protection.

#### ASME Inc. and SMM Inc shared facilities

**Location:** Peterson Road Reserve, Waipuna Road, Pannure

**Public Running:** Every Sunday

## Box Hill VIC

The club has recently installed some new rail sections and also purchased two ex shipping containers for use as garden equipment sheds.

Saturday, 19th October saw the club host an all-comers day. One loco of particular interest to many was John Bone's *General*, which has been faithfully restored. Another item which attracted interest was the running gear of a NSW 3-cylinder D-57.

#### Box Hill Miniature Steam Railway Soc. Inc.

**Location:** Elgar Park, Cnr Elgar & Belmore Rds, Box Hill North

**Public Running:** 2nd & 4th Sunday

## Berkeley USA

The GGGS Fall Meet saw the steaming bays full by 10am Saturday and the attendance records show over 400 on the Saturday and quite a few on the Sunday. 55 dinner tickets for the Saturday night were capped off by a sunset ride on the Redwood valley Railway. Night running on the Saturday presented visitors the chance to see the signal system at its best.

The passenger loading track is being replaced in steel, with 30ft of track going in to finish the project.

Both engines are running OK. A lot of work done to the Pacific over the last few months, including work on the oil burner and the renewing of the tender. Rolling stock is all running OK.

#### Golden Gate Live Steamers Inc.

**Location:** in Tilden Park, Loma Cantadas & Grizzly Peak Blvd., Berkeley CA.

**Public Running:** Every Sunday

## Bulla VIC

The Tullamarine club has been at the new Bulla site for two years now and the progress at the site has been great. The greening progresses well and the transplants from Tulla have taken hold.

Club income has picked up with private runs added to the now twice monthly public runs. The idea has been floated that during the quiet time in the middle of run days, that the smaller locos can do the running for a couple of hours, thus easing the burden on the club equipment which is bearing the main burden of cost and maintenance time.

The 7 1/4" carriage turnover apparatus has been completed to allow easy access for servicing, without the usual risk of strain associated with these carriages.

The two club steamers' air and boiler feed pumps are to be converted to steam operation. The batteries and compressors have been very maintenance intensive. Funds have been allocated for the job.

Alf Harder's crossing and signal signs are complete, making the yard look like a real railway. The loading ramp at the western side of the workshop has been repaired after suffering a mis-adventure.

#### Tullamarine Live Steam Society

**Location:** 15 Green Street, Bulla

**Public Running:** 1st and 3rd Sunday

## Canberra ACT

September saw the CSMEC host the annual invitation run at the Kingston Miniature Railway, with many visitors (and locos) attending from interstate. October saw the CSMEC host the 10th National Miniature Traction Engine Rally. A full report begins on page 22.

#### Canberra Society of Model & Experimental Engineers

**Location:** Geijera Place, Kingston

**Public Running:** Last Sunday

## Casino NSW

The society is now running every Sunday. Tickets are \$3 for the two kilometre, forty minute round trip to Old Casino Station Museum and back. Picnic shelters are located at each end of the line.

The club welcomes other clubs and members to visit. Your loco will be really tested on the famous Norco Bank.

We are next to the golf club and motel/hotel caravan park accommodation is plentiful. Visitors contact Ross Metcalf (02) 6663-3319 a.h. The club is open for membership and welcomes new members.

#### Pacific Coast Railway Society Inc.

**Location:** Cnr Queensland Rd and West St, Casino

**Public Running:** Every Sunday

## Eltham VIC

The station canopy lighting has been completed and commissioned. Re-sleeping and re-ballasting has been carried out on the outer circle near Chelworth Bridge. The way and works and signalling branches have been busy with the installation of the new double slip and catch points. Track work is progressing for the new track alongside the ash pit road in DV yards. Tree planting along the Avenue of Honour is progressing. Conduit and pit work has been completed in preparation

for the construction of the new 'B' signal box. A large amount of old water pipe (for signal and point control) has been removed and replaced with new copper pipe.

The construction of the new locomotive progresses well at the contractors with all concerned being very happy with the excellent workmanship.

*Pauline* is out of service for boiler tubes renewal, firebox repairs and tender re-furbishment. G527 has been re-tyred and the bogies renovated. S301 has had its coupler heights adjusted and persistent fuel problem repaired which has regained the reliability of the locomotive. The Doggies have had a lot of electrical work completed and some new wheelsets fitted. The private loco roster of eight locos continues to support the public running roster.

The *Eltham Festival* has been and gone, with active participation and support by the DVR. X44 was part of the street parade while the railway ran all weekend. A diesel loco from the Bulla Railway also came and assisted with the moving of people. Sunday was a quiet day.

#### **Diamond Valley Railway Inc.**

**Location:** Eltham Lower Park, Main Road, Eltham

**Public Running:** Every Sunday and public holiday

## **Fairfield NSW**

Due to the number of members who are unable to run on Sundays, the club is rescheduling their monthly run day to the first Saturday for a trial period. The club is planning to hold an interclub run on their July running day.

#### **Western Districts Live Steamers Co-op Ltd**

**Location:** Fairfield Showground, Fairfield

**Public Running:** 1st Saturday

## **Galston NSW**

25 years of the club was celebrated last October with the annual birthday weekend run.

The construction of the rail triangle is complete, with the points being known as North, West and East Fork respectively. Work has commenced on the loco area shelter. Electricity supply has been extended to the unloader shelter with power outlets, lights and a floodlight. Work on the traction engine track is progressing with the trenches ready for the foundations to be poured. A char cutter is under construction.

Difficulties are occurring with the water quality on site for the locomotive boilers as the calcium in it is depositing in the boilers and fittings. A rainwater tank is to be procured and is to be sited near the

unloader.

Difficulties are sometimes being experienced on the track with oil being deposited by some members.

Three special run days were held September through November, but the November public day was cancelled due to rain.

#### **Hornsby Model Engineers Co-op Ltd**

**Location:** 29 Mid Dural Road, Galston

**Public Running:** 2nd Sunday

## **Gore NZ**

The Labour Weekend was considered to be a success by all, even though the weather did its best to disrupt the fun. Visitors started arriving on the Friday night. Saturday saw the public rolling up at 9.30 and trains ran all day (despite the blustery conditions), with up to eight locos on the track at one time. On Sunday many went on a bus trip while the remainder steamed up. Some of the locos had a bit of trouble with their new diet of Ohai coal, but settled down once their drivers had mastered the required firing technique. The crowd was not as big as Saturday, but kept coming in all day. Some very hardy souls ventured out for the night run and the Dunedin *Beefax* continued to illuminate the darkness well into the night with its shower display.

#### **Gore Model Engineering Club Inc.**

**Location:** Hamilton Park, Gore

**Public Running:** Third Saturday

## **Gosford NSW**

During the past year, the club has concentrated on repayments of outstanding loans. With two washed out running days there is still a little way to go.

The tractor motor has had a re-build and the amenities rooms have been cement rendered. Also, the club was donated a post drill and a lathe and the ride on lawnmower has arrived from the Gosford council.

October run day with eight locos in attendance was a fairly slow day passenger wise (due to the heat and elections). November run day, there were two party groups, run with two trains and the later normal running was complemented by another six locos joining the roster.

#### **Central Coast Steam Model Co-op Ltd**

**Location:** Lot 10 Showground Road, Narara

**Public Running:** 1st Saturday

## **Invercargill NZ**

Last September and October were extremely busy times for members with the final finishing of the station building and the re-furbishment of the running gear on the riding trolleys. Two new members

have joined the Southland club and there were many membership enquiries about the club resulting from the Great Little Train Show.

#### **Southland Society of Model Engineers Inc.**

**Location:** Surrey Park, Invercargill

**Public Running:** None

## **Maidstone NZ**

The concrete work to re-route the elevated railway (to make way for the 7 1/4" ground level railway) has been completed. Many extra hours have been put in to restore the elevated track and we now have a good robust, low maintenance section of track. The club has again been very fortunate to obtain a substantial grant from the Rimutaka Licensing trust for use specifically on the ground level railway.

#### **Maidstone Model Engineering Society Inc.**

**Location:** Maidstone Park, Upper Hutt

**Public Running:** ???

## **Mangere NZ**

The NZR Ab class loco has been adopted for the new club logo and this will be reflected in club badges and letterheads.

15 metres of park track has been re-laid in bush tramway style. The new trolleys have had more float put into the bogies to improve their reliability. Another ride car has found a sponsor, bringing the total number of sponsored cars to five. The sponsorship monies are used for the construction of the cars plus some left over (for maintenance?).

Patronage for the Sunday runs has been consistent with the same locomotives generally doing the hauling.

#### **Manukau Live Steamers Inc.**

**Location:** Mangere Centre Park, Robertson Road, Mangere

**Public Running:** Every Sunday

## **Maryborough QLD**

MELSA recently participated in the new tilt train commissioning celebrations. Full size loco B15 No.299 was on display, as well as other Walkers Ltd products which

## **What has your club been up to?**

We all like to keep in touch!  
Send a brief note to tell us!

Or post a copy of your **newsletter** - but make sure you use a highlighter pen to show the item you would like us to publicize. Remember to concentrate on news that appeals to AME's wide range of readers.

reflected locomotive development over the last century.

The operations of MELSA Maryborough received a great compliment from Dr John Kingston, state MLA for Maryborough who said, "To me, MELSA encapsulates the pride and capabilities which have made Maryborough a successful and enduring city, and its achievements are not often recognised". Dr Kingston's pride was so evident that he has invited the Minister for Transport to visit the city and attend a MELSA track running day.

#### **Model Engineers & Live Steamers Association Maryborough**

**Location:** Queens Park, Maryborough

**Public Running:** Last Sunday

#### **Moorabbin VIC**

The club remains healthy with approximately 160 members. Garden gauge railways appear to be experiencing an increasing following in the club. If there is sufficient interest the committee will support the establishment of a garden gauge layout within the club grounds.

Silvertops day remains very popular during the week with twenty odd members attending and anything between five and ten locos in attendance.

Club run in October attracted 13 locos to the roster including a depot transfer for a *Bundaberg Fowler* from the Galston club in NSW. (The owner is now working in Melbourne.) November run day saw 42 members with 10 steam and three electric locos on the roster. Included was a life member from Qld and son with their 3½" gauge VR streamlined S class *Matthew Flinders*.

A miserable day for the October Public run day, but still 39 members turned up, despite the fact that many others manned the club display at the Model Engineering Exhibition on the same weekend.

The Moorabbin club hosted the AMSC/AALS training weekend on 14/15th November with 36 delegates from Victorian clubs coming from far and wide. Many thanks to the SLSV catering team who provided excellent fare on both days.

15th November saw a special run for the Beaumaris Primary School. Nine locos ran the roster with a couple in reserve. A feature of the day was the double heading of *Moguls*, with both drivers relishing the exercise.

#### **Steam Locomotive Society of Victoria**

**Location:** 128 Rowans Road, Moorabbin

**Public Running:** 1st Sunday except January

#### **Morphett Vale SA**

The rolling stock co-ordinator (while waiting for an auto coupler order), made

up some non-working (fixed knuckle) auto couplers and trialed them on some service waggons. Such was the success that these have been fitted to all service waggons at one end. This has saved a lot of money and also serves the flexibility that autos give.

The second club loco has been fitted with a straight air brake system, increasing its car hauling capacity.

Per Way branch has removed section of the old main line and replaced it with plastic sleepered T-section rail, simultaneously re-aligning two sharp curves and a short straight to a continuous large radius curve with transition sections.

At a general meeting it was decided to purchase safety vests (for members identification to the general public). These are now being worn and favourable feedback has been received from the public with the club's attitude to safety.

The Xmas party on the 12th December was attended by many, with the arrival of Santa and helpers by train ensuring its success.

#### **Morphett Vale Railway Inc.**

**Location:** Wilfred Taylor Reserve,

*Wheatfield Road, Morphett Vale*

**Public Running:** 2nd and 4th Sundays

#### **Nelson NZ**

The 40th Birthday weekend was celebrated with the new clubhouse finished to the lock-up stage. People started rolling up early on the Saturday and members didn't stop all day, with over 1000 free pass tickets given out and over 250 rides taken in the *Navy Lark*. Sunday was even better with over 3000 tickets issued.

Due to the diligence of operators, safe practices on the railway have been greatly improved, especially around the steaming bays which is a public restricted area. The weekend went off virtually incident free.

A workbench has been donated for use in the boatshed workshop. The new clubhouse nears completion and the lights have been wired.

#### **Nelson Society of Modellers Inc.**

**Location:** adjacent to Tahunanui Beach,

*Walkare St, Tahunanui*

**Public Running:** Every Sunday

#### **Newcastle NSW**

All systems are go as the club continues preparations for the Easter Convention. The 5" marshalling yard is finished and work is progressing on the elevated track. Two tracks have been added, this to centralise the 3½" and the 5" to provide a more stable ride. The traverser is complete and by the time this is read, it concrete should have been poured and the unit installed. A team is in the process of re-

arranging the the 3½ / 5" loco area, to facilitate a new traverser and give more steaming bays.

The privacy wall on the ladies amenities has been replaced. All in all, convention work is on target and all projects started are expected to be completed well before the convention.

#### **Lake Macquarie Live Steam Locomotive Society Ltd**

**Location:** Off Velinda Street, Edgeworth

**Public Running:** Last Sunday

#### **New Plymouth NZ**

Many members attended the Harold Sinclair weekend in Havelock North last September (see report on page 25).

Track maintenance has been completed and the new overbridge is in place. The track was examined by the track inspector in preparation for renewal of the amusement devices license.

#### **New Plymouth Society of Model Engineers**

**Location:** Cnr Liardet and Gilbert Sts, New Plymouth

**Public Running:** Every Sunday

#### **Petone NZ**

The last auction provided some entertainment for 22 members. Some of the Maidstone members have been joining the Hutt meetings.

Cracked welds in the track have been repaired but members are aware that other cracks are appearing near the ends of straights where flexing occurs due to expansion.

#### **Hutt Valley Model Engineering Society Inc.**

**Location:** Marine Parade, Petone

**Public Running:** Every Sunday

#### **Perth WA**

The fitting of a new span to the Stanbridge has been delayed while waiting for council engineer approval. The fire train has received maintenance for the summer season, with repairs to the water pump and prime mover. A motor and pump has been placed close to the river to allow quicker re-filling of the water tanker train. The workshop and surrounding area is looking much better now after a concentrated effort by several members to clear away and clean up the area.

Locomotives *Jamie* and *C.Y.O'Connor* will be returning to the CMR and will be a welcome addition to the roster.

There is a plan to implement specific boiler inspection dates at intervals during the year to alleviate the problems with boiler tests on run days.

Club income is starting to return to normal after the three month closure of the site

early in 1998, and reduced running for two months until operations were allowed back at the main station.

#### ***Castledare Miniature Railways of WA Inc.***

**Location:** rear of 100 Fern Road, Wilson  
**Public Running:** 1st Sunday

#### **Prospect SA**

A notable change occurred at the AMSRS AGM — the club has a new secretary. After 25 years as club secretary, John Wakefield decided to step down to be replaced by Peter Hoye.

The member's annual show of work took place in November. On show were part-built SAR "X" class and PRR switcher locos, field gun, stationary engines, sphere cutting tool, "D" class mail van and a SAR Dynamometer Car, to name a few.

#### ***Adelaide Miniature Steam railway Society Inc***

**Location:** 370 Regency road, Prospect  
**Public Running:** 4th Sunday

#### **Tauranga NZ**

A discussion among members about the possibility of clubrooms being built adjacent to the station is gaining momentum. Ideas and opinions are coming through from many members. The executive note that the club should take advantage of the Rotary Club's offer of additional land (in the future) for the club.

Two members attended the North Island one metre yacht championships.

#### ***Tauranga Model Marine and Engineering Club***

**Location:** Memorial Park, Tauranga  
**Public Running:** Every Sunday

#### **Wagga NSW**

The annual November invitation run has come and gone and was its usual successful weekend with model engineers and visitors coming from all the eastern states.

Recently, a Chinese trade delegation visited the Wagga track and were very impressed with the facility and the local council's support and involvement with the railway. Realising the enormous tourist potential of such a railway, they have approached the Wagga club and council to assist them with planning and building their own public railway in China.

Work continues with the new loop construction, with major earthworks completed and the alignment for the track in place.

#### ***Wagga Wagga Society of Model Engineers***

**Location:** Botanic Gardens, Wagga Wagga  
**Public Running:** 1st and 3rd Sundays

#### **Warner QLD**

The annual trophy day brought out the best in model engineering and several members reaped the benefits of their efforts and received the accolades of their peers. Denis Tregea (and co-builder Henry McMillan) won the Championship Cup with a 5" gauge scale version of the 0-4-2 Fowler cane loco of the Babinda sugar mill. The *Anzac* name is prominently displayed on the sides.

Continuing his fascination with Sydney ferries, Don Hincliffe won the Engineering Trophy with his exceptional model of the paddlewheeler *Brighton*. The Unfinished Model Trophy was awarded to Jess Jestic with his Stanier Black Five in 7 1/4" gauge. The design genesis was from a Martin Evans *Highlander*. The Myford Encouragement Award went to Paul Kilminster for his 5" gauge *Blowfly*.

The main track between the signalbox and steaming bays point have been re-laid, removing all kinks and bumps. The replacement track is slightly curved in place of the straight track it replaced, so that heat expansion can be better accommodated. The new shed has been painted and a roof has been provided over the coal grinder.

#### ***Qld Society of Model & Experimental Engineers Inc.***

**Location:** Warner Road, Warner  
**Public Running:** None

#### **West Ryde NSW**

September running day had a very good roll up, both passenger and motive power wise. There were some long queues at time but the service catered for them well. Mostly big power on the ground, ably assisted by visiting *Bitza* from Illawarra. The elevated was well catered for with five locomotives rostered and one on standby in the roundhouse.

In October an eight car train was trialed, Warwick Allison's big V class piloted, with Henry Spencer's R class being the train engine. After initial braking problems were overcome (grass seed removed from a brake ejector) the train ran very successfully. Of note is that the train engine brake piping was such to allow the pilot engine to do the train braking (*as was done on the prototype in steam days ... Ed.*) The train engine driver could also observe the train vacuum from his own cab.

The new inner main deviation is complete and has been working well. Trains can now approach at normal line speed and ride well on the smooth sweep past the sidings. The super elevation seems to be staying where it should, so the effort has been worth it. The last of the old original track which formed part of the inner main platform exit crossover has been

replaced with new track.

The ground level green carset have had the bolster bearings on each bogie moved inboard, along with a general overhaul. An improvement to the brake connection is the fitting of intermediate air hose connectors. These permit air hoses to be parted in the middle rather than removing them from the end pipe. As well as the advantage of being much easier, the shorter hoses do not drag or get in the way.

Three members have been improving the seating in the grounds. Timber is redeemed where possible and rusted fasteners have been replaced.

Preparations for the major council drainage works to go through the West Ryde site saw 40 odd members and friends turn up on Sunday 17th January to remove all track from the bottom area of the park and remove the Hawkesbury Bridge. The council drainage works are extensive and this has meant that the February running day was cancelled due to this work being timetabled for completion early March. The club hopes to replace and re-commision all trackwork on the weekend of 13/14th March.

#### ***Sydney Live Steam Locomotive Society***

**Location:** Anthony Road, West Ryde  
**Public Running:** 3rd Saturday

#### **Wollongong NSW**

The ILS has lost four running days in the last 12 months, culminating in the whole site being flooded out in August. This caused havoc to the North Signal Box electrics and damage to everything which is water susceptible. The Blue Mountains club has since made a substantial donation to ILS to help them get the necessary repairs done and get "back on track". A tremendous effort of repairs and re-habilitation saw operations (more or less) back to normal for the September running day.

Double heading appeared to be the order of the September run, with double headed Blowies, GMs and 36s. 5903 was also slotted into the diagram as a pilot engine, as the driver was "over distance" from his own depot. October run day saw 3801, 5901, 37 class, LNER T class, 1243, Complex and a *Maid of Kent* all running, to name but some. The smile on the Treasurers face said that it was a good day.

#### ***Illawarra Live Steamers Co-op Ltd***

**Location:** Stuart Park, Virginia Street, North Wollongong  
**Public Running:** 4th Sunday

**Want to know more....?**  
**visit the AME club website at**  
<http://www.ameng.com.au>

## Coming Events

**6 March 1999**

**Scale Running Day — Galston NSW**

The Hornsby ME members invite you to a Scale and Timetable run at the GVR, 29 Mid Dural Road, Galston. See article on page 43 for details on how these weekends are run and what the requirements for trains are...

**6 to 7 March**

**Open weekend — Palmerston North NZ**

Hosted by the Palmerston North Model Engineers Club

**6 to 8 March**

**Corroboree '99 — Eltham Vic**

Diamond Valley Railway invite one and all to their March long weekend Corroboree. Friday from 4pm, Saturday fun run till 8pm (no public), Sunday public running 11am to 5pm and then all night running until 5pm Monday (03) 9439 1493 for further details.

**13 to 14 March**

**Open weekend — Tauranga NZ**

Hosted by the Tauranga Model Marine and Engineering Club

**20 to 21 March**

**Open weekend — Hamilton NZ**

Hosted by the Hamilton Model Engineers at their site in Minogue Park, Tui Ave, Hamilton

**2-5 April 1999**

**AALS 43rd Convention — Edgeworth NSW**

Lake Macquarie Live Steamers are hosting the 1999 Convention. You should have your registration forms in by now. For further information, contact: The Convention Secretary (Jeff Wakeham), PO Box 200, East Maitland, NSW 2323 or Ph (02) 4933 4526

**2 to 5 April**

**Annual Easter weekend — Panmure NZ**

Hosted by the Auckland Society of Model Engineers

**2 to 5 April**

**Keirunga Park RR open weekend — Havelock North NZ**

Hosted by the Havelock North Live Steamers & Assoc

**7 April**

**Post-Convention run — Wollongong NSW**

Members of the Illawarra Live Steamers are holding a post-convention (Wednesday after the Convention) run at their track in Virginia Street, North Wollongong (entrance opposite the Scout Hall). Off street parking, brick amenities available, no showers. Bottomless cups of tea and coffee freely available all day and BBQ lunch for a small fee. Char, kindling, 12volt DC, 240 volt AC, compressed air and steam oil supplied. Ross (02) 4284 4202 or Warwick (02) 9520 8186

**24 to 26 April**

**Special Run Weekend — Rotorua NZ**

The Rotorua Society of Model Engineers invite all clubs to attend this special run on Anzac weekend.

**1 to 3 May**

**Annual Labour Weekend Run — Mackay Qld**

For a good weekend make a point of being at the Mackay Society of Model Engineers club grounds at Planlands on the southern edge of Mackay (behind the racecourse)

**8 to 9 May**

**10th Annual Steam Fest — Wonga Beach North Queensland**

The Annual Pinnacle Village 5" gauge Steam Fest is on again. As it is the weekend after the Mackay Run (see above), why not head further north to Pinnacle Village, Vixies Road, Wonga Beach. Discount on-site accommodation available, also camping and powered sites. (07) 4098 7566 for further enquiries.

**22 to 23 May**

**Annual Kindred Society Day — Moorabbin Vic**

The Steam Locomotive Society of Victoria are once again hosting this annual event. The theme this year is Electric Trams and other Electric Locomotives, inspired by the fact that the recently serialised G E Tram originated in SLSV. Others not excluded, all comers welcome. BBQ lunch and endless tea and coffee

**29 May**

**AALS NSW Interclub Meet — Mudgee NSW**

**5 June**

**Diesel Day Run — Galston NSW**

Once again the Hornsby ME Co-op is holding its non-steam run at the GVR.

**5 to 7 June**

**Open weekend — Mangere NZ**

Hosted by Manukau Live Steamers

**12 to 14 June**

**Hot Pot Run — Wollongong NSW**

2½", 3½" and 5" tracks in scenic grounds. Model trains, traction engines, boats, stationary engines and "swap meet". Entry price is 2 cans of soup. Contact Warwick Aston (02) 9520 8186

**27 June**

**Annual Birthday Run — Bracken Ridge Qld**

An invitation is extended to attend the special annual Mackenzie Line birthday run in McPherson park, Denham Street, Bracken Ridge. This is a 5" gauge, steam only line. Char and operator lunches provided by the Lions Club of Bracken Ridge Central, operators of the line. Steam up from 8 am, and night run if sufficient interest. 680m loop

track, include 100m each way at 1:80 grade, loco and passenger sidings, 5" gauge only. Contact: Neil (07) 3261 2042 or Ross (Goldie) (07) 3269 8544, email: goldicom@powerup.com.au

**4 to 5 September**

**Birthday Run — Gosford NSW**

Central Coast Steam Model Co-op members invite you to their annual birthday run.

**25 to 26 September**

**Invitation Run and Floriade — Canberra ACT**

Time again to enjoy trains and tulips in the National Capital.

**8 to 10 October**

**Birthday Run — Galston NSW**

Hornsby MEC annual birthday invitation run at the Galston Valley Railway.

**22 to 25 October**

**Keirunga Park RR open weekend — Havelock North NZ**

Hosted by the Havelock North Live Steamers Assoc.

**22 to 25 October**

**Open weekend — New Plymouth NZ**

Hosted by the New Plymouth SME

**22 to 25 October**

**Fun Weekend — Hamilton NZ**

Hosted by the Hamilton Model Engineers

**23 to 24 October**

**11th National Miniature Traction Engine Rally — Inverell NSW**

This year the rally moves north again. More details later. Organiser Gordon Blake (02) 6722 4272

**30 to 31 October**

**Blowfly Rally — Orange NSW**

Further details will follow

**6 to 7 November**

**Invitation Run — Wagga Wagga NSW**

Wagga Wagga SME members host their popular annual big event.

**6 to 11 January, 2000**

**Model Engineers Convention — Blenheim NZ**

Marlborough Associated Modellers are hosting this 2-yearly event. 2½", 3½" and 5" elevated and 5" and 7½" ground level tracks. Boat pond with harbour complex and tethered car facilities. Further details later.

**12 to 14 August**

**2000 IBLS Meet of the Millennium — Burnaby, B.C. Canada**

Some details appeared on page 16 in the last issue. If you are interested in going, or would like to know more, contact Barry Glover 31 Spinks Road, Corrimal NSW 2518, Fax (02) 4283 2331



# Letter Box



## Metrication

Sir,

It would be interesting to take a census of the members of the model engineering clubs throughout Australia to establish their median ages. My guess from observation over many years at conventions, inter-club runs and private visits to other clubs, etc, all over the country, is that at least 75% of the current membership would be over 50 years old, which means that they went to school and/or served their apprenticeship under the Imperial system of measurement, and hence automatically think along those lines. Like King Canute, we cannot roll back the tide, not impede progress, so we are stuck with the metric system now, whether we like it or not.

An interesting side-line is that the metric system was legislated for back in the last century in USA, but our American cousins are still happily carrying on with their version of the Imperial system, eg miles, lbs, gallons, etc over 100 years later. (To hell with the legislation, they say).

The problem with we older generation is that we cannot "visualise" in metric. If someone says a crank pin is  $3\frac{1}{2}$ " dia, or a rail track is 2 $\frac{1}{8}$ " gauge, an immediate impression of the *actual size* springs to mind. We are used to measuring with a 1" micrometer, and can readily identify with a "couple of thou" interference fit etc. But if someone tells us that the same crank pin is 88.5mm dia., it sounds like a lot of gobbledegook. The figures of themselves tell us nothing and convey no impression at all of what the real size actually is. We have to immediately do a mental conundrum to figure out what roughly the size is, in inches, to get a true impression of the size that is being referred to.

So it is when we come to build a model of some particular prototype of anything. Almost all of the originals which we model are "historical" models, particularly steam locomotives, which were all built during the hey-day of the imperial system. It is quite easy to reduce a drawing of a full size job to 1" = 10" scale (in fact many of the original drawings were drawn to such a scale where appropriate) and one gets an immediate and accurate

impression of the finished size and shape of the proposed model. When a drawing is published showing only metric measurements, we often have to go through the tedious process of converting all the sizes to imperial ones to be able to "visualise" the sizes, never mind building the jolly thing.

The next consideration is *tooling*. Quite apart from most of the older lathes etc which most of us possess, which are graduated in inches and "thous" with which we are familiar and can readily identify, almost all out hand tools such as taps, dies, etc are in Whitworth, 26, 32 or 40 threads/inch or BA and so forth (albeit BA being a kind of metric size).

Now apart from convenience, there is a practicality. Joseph Whitworth was a very clever man when he designed and promulgated his thread standards back in the middle of the last century (to standardise the then existing multitude of currently used sizes) he did it very cleverly, so that all the relevant parts of the bolts and nuts (or where a tapped hole went directly into a casting) were in equal proportion regarding shear and tensile stress, etc to maximise the holding power of the bolts. In other words, the shear strength of the threads is roughly equal to the tensile reaction of the root dia. of the same bolt. These coarse threads are particularly important when tapping into a soft material like cast iron or cast aluminium, where it is very easy to strip a fine thread if one is not particularly careful; and likewise it will not hold as well in service as the coarser one, especially if there is a need to remove the bolts at frequent intervals for overhauls, etc.

Now I realise that there are metric equivalents for all this and nothing is beyond the power of ingenious model engineers to work it all out. We do this consistently in our normal production, and half the fun of the job is identifying and overcoming the various problems we encounter. It keeps the brain active (mostly without the use of calculators). Nevertheless, I put forward the case that, as far as future model drawings in AME are concerned, and for the benefit of the vast majority of readers and users thereof, that, at the least, the drawings should be anno-

tated "bilingual". It would save an awful lot of angst and trouble.

Murray Hill  
Victoria

*(I think that in most cases putting "bilingual" dimensions on drawings would make them look very cluttered and difficult to read, particularly if there were lots of small dimensions. My reasons for publishing the Bunyip series in metric only, were given fully in the July-August 1998 issue, so I will not repeat them here. I can fully appreciate the argument Murray has put forward, as I am now one of those who are over 50, but I should add that I find myself using metric measurements most of the time in the workshop now, and I think I started doing this when I found it harder to get materials in imperial sizes and made a subconscious switch. I will be interested to see the results of the survey we did some time ago, to get a better idea of what the average reader is like. We now have some extra assistance in processing the thousands of returns which we received, so the results should not be too far away ... Ed.)*

## Spark eroders and EDM

Sir,

In reply to Graham Lill (*Letter Box* issue 81)

My knowledge of Electric Discharge Machines (EDM), or Spark Eroders is a bit dated (late 70's). Commercial machines have power supplies in modules of 50 amps with sensitive hydraulic controls to move Ram/Electrode combinations of several hundredweight, no back lash or over run allowable.

The major hassle with any machine is the dielectric oil, which looked like high voltage transformer oil to me. Whilst not recommended some operators used kero. Either liquid is a health hazard, dangerously inflammable and down right messy. The dielectric must be filtered and pumped under pressure through the job or electrode as well as in sufficient volume to immerse the cutting action under two inches of liquid.

The swarf (?) is said to be in the form of hollow metal spheres looking much like black sand which turned grey as the used oil drained away (cubic inches of metal removed equals massive amounts of sand to be removed).

For light engineering a 25 amp power supply would be more than adequate. A 56 volt secondary 1.5 kVA transformer with a bridge rectifier and heaps of capacitors (20,000mF at 200 vDC would be costly to obtain) to supply the necessary 70 volt DC supply. A pulse generator with an adjustable duty cycle, to supply a frequency range of 2 kHz to 250 kHz and a duty cycle of 80% 5v pp. One of the pulse width modulating motor speed controls would be

worth a look.

The out put modules are only transistor switched resistors in parallel. Note non inductive resistors are needed here! The pulse generator drives a bank of out put transistors Darlington fashion and switches-in the collector circuit, adds transistors and resistors in parallel, to increase the cutting current.

A drill press can be used for the vertical movement, insulating both the electrode and work piece. The household earthing should never be overlooked. A plastic bucket will act as a reservoir for the dielectric as well, this is a handy test bench for a power supply, a fine touch on the handle being necessary. Please maintain at least 2 inches of liquid over the cutting surface and a suitable fire extinguisher at the ready.

Two sensing leads are taken right at the work piece and electrode connections to sense the gap voltage. An Op amp resistor net work reduces this voltage (around 30 volts when cutting) and when fed to an adjustable voltage comparator, this in turn enables/disables the pulse generator drive and is the feed back to the DC servo drive closed loop system. A model size permanent magnet motor (0.25 inch shaft) driving a small ball screw/nut system is adequate for the ram drive although some form of brake is necessary to prevent the ram sinking. NOTE this is definitely not a machine to walk away from; while relatively slow, a leak in the liquid supply line can expose the cutting action — and instant fire!

A fault in the flushing system can form a scab at the cutting surface which, if left, can grow and back the electrode up towards the dielectric surface and more fire! 10 or 20 gallons of flaming kero or dielectric oil won't leave much change from your favourite working place.

Doug Horner  
New South Wales

## Morse taper shanks

Sir,

When Alex Russell's article on *Morse Taper Shanks* was published (May-June 1998), I took a photocopy of his No 2 Morse Taper drawing to put up in my workshop, and found I already had the information there: small end 0.572" big end 0.700" but the distance between was  $2\frac{9}{16}$ "! Which was right? A check on the tail stock centre suggested  $2\frac{9}{16}$ ", so I consulted *Machinery's Handbook*, 12th Edition, page 1407, *Morse Standard Taper Shanks*. The small and big ends are correct and the distance between is  $2\frac{9}{16}$ "; the overall length, including the tang and a small amount beyond the big end 0.700", is  $3\frac{1}{8}$ "

Having found this out, I am at fault by

doing nothing about it, waiting for somebody else to write in. Nobody did.

Ted Crawford's article *Making No 2 Morse Tapers* (July-August 1998), used different small and big end diameters, so again the first error is not apparent. So, at last, I write, regretting my delay, because it is essential that any errors that creep into our magazine should be corrected, preferably quicker than my efforts.

Also, congratulations to Hugh O'Dempsey on his *Narrow Gauge Rail Truck* (January-February 1999). It looks a convincing and easy to handle freelance model. His article well describes the delightful and interesting experiences he had in its construction. I also find, particularly in freelance work, that I need the help of God to give me answers, so I can share with Hugh his delight. Let's face it, God is the greatest builder of all times!

Noel Stokes  
New South Wales

## A day at the mine

Sir,

The Cadia Hill mine is an open cut boasting the biggest SAG mill in the world. SAG stands for semi autogenous grinding. It is loaded with steel or cast iron "cannon" balls, about 125mm diameter to assist in the initial crushing of the ore. Two follow-up mills grind the ore down to a black powder with the consistency of flour. It is concentrated by flotation and pumped as a slurry by pipeline to Blayney whence it is railed to Sydney. Then it is taken by ship to Japan for smelting and separating the copper from the gold. The gold content of the lateritic ore is only 0.8 gms per tonne so the mine must handle enormous tonnages to be profitable. Hence the Caterpillar, and dozers like a D11 with a blade about 4 x 2 metres. The fleet of Caterpillars is loaded by one giant

Komatsu caterpillar excavator taking cubic metres per scoop. It even manages to dwarf the trucks. Unfortunately it was working elsewhere and not available for photographing on the open day.

An interesting fact is that much of the large amount of water needed for the ore processing is waste water from the Orange and Blayney sewerage works. This is pumped the 25km to Cadia to supplement the relatively limited amount available from local creeks (especially important during dry spells).

The company had to comply with over 100 legal environmental constraints to develop the project. So you really wonder why they bothered!

A nearby deep underground ore body was discovered later by deep drilling, and is now being developed by means of a tunnel over 300m deep. This ore assays about 2.5 gms per tonne and while not a big enough body in its own right, it becomes a feasible proposition with the open cut.

Cadia was mined for gold last century but the payable ore soon ran out. It was mined briefly for iron during the war and has even been mined for radium. The mine works are said to take about 1/2% of the total power

used in NSW, most of which would be for the grinding mills and for the conveyor belt that builds the giant ore pile.

What a model this Caterpillar would make — radio controlled of course! The driver sits nearly 4 metres above the ground in an air conditioned cab with music, and 2-way radio to direct all opera-

*Peter's wife, Enid, who stands at 170cm (5'7") gives an idea of the size of the 1000hp Caterpillar tipper. Those tyres cost \$28,000 each!*

Photo: Peter Dawes



tions. At 2" to the foot it would be a commercial tip truck in its own right. In 1" scale it might just fit the workshop. In 1/2" scale it might just fit on the workbench.

Peter Dawes  
New South Wales

## GELSA locomotives

Sir,

May I, through your magazine, thank James Tennant for giving details of the GELSA steam locomotives for Brazil. I have, since 1974, tried to obtain details of these interesting 2-8-4 and 4-8-4 locomotives. There is a picture of a derelict 2-8-4 at Campos, in a highly recommendable book by Roy Christian and Ken Mills called *World of South American Steam*.

I believe these complicated locomotives did not remain in traffic long due to maintenance problems. Any further details, I would be pleased to receive. An old friend of mine sent me the May-June issue of your excellent magazine, along with a calendar of Australian trains. Unlike my friend, I am not a model engineer, but a model maker in 'O' gauge. I have scratch built a collection of a dozen Canadian steam locomotives.

I would like to mention that after my army service, I was an engineer trainee at the Hyde Park works of the North British Locomotive Company. I worked on the 'Pm' class pacifics for Western Australia, also at the beginning of the 'R' class (VR) contract. I left NBL to work on the footplate at Bletchley on the west coast mainline. Hoping this will be of interest to your readers,

J H Sanders  
Bedfordshire, UK

## A little nostalgia

Sir,

I recall some issues back in AME, the picture of a dismantled locomotive of the *Hales Creek Railway*. I thought the pictures of the two locomotives in operation would be of interest on the unusual gauge of 6 inches. Also on this same page from *Railways in Australia* (Jan 1951) is the picture of a 12" gauge 4-4-0 old "A" class of the Victorian Railways, owned by Captain James. (*Unfortunately the photos referred to did not reproduce well enough for publication, but this letter is interesting nevertheless ... Ed.*)

Captain James had the Model Dockyard in the basement of 216 Swanston Street, Melbourne, the place for steam enthusiasts, where a range of castings to build your own steam engine, as well as finished steam engines, could be purchased.

Then there was a range of blue prints available for various models, including a

set to construct a coal fired locomotive in 2 1/2" gauge, to either a pacific or atlantic locomotive. Castings were available to suit. Another set of blue prints listed an atlantic locomotive to the 9 1/2" gauge.

In the Jan-Feb '98 issue of AME, John Snowden asks about the 12" gauge locomotive at the Melbourne Steam Traction Engine Club. I can recall, in the few weeks leading up to Christmas, as children we would be taken to Myers where the engine and train would be operating in the basement of Myers, just off Lonsdale Street. Coke was used as fuel; a plate on the side of the cab read *Myer Melbourne*. I don't recall those smoke deflectors back then. Then another year later we went to the Myers basement and it was not there anymore.

Arthur Payne  
Victoria

## "R" class castings

Sir,

I recently bought a set of castings for 3 1/2" VR "R" class. Chassis and driving wheels are finished and assembled, springs, axle boxes and feed pumps. Plans included are:

Sheet 2 Frame details  
Sheet 4 Wheels, axles, axle boxes  
Sheet 6 Valve gear details  
Sheet 7 Valve gear details

These were drawn in 1956/7 by "L.A.D." One is stamped "I.C. SMART" They are stamped on the back: "From S.H. Milligan, 274 Mont Albert Rd, Surrey Hills E10, Vic Australia" and "Surrey Hills Steam Locomotive Society"

Can anyone supply copies of missing drawings, or could anyone who has made this "R" help?

Darryl Cleburne  
New South Wales.

*(If anyone is able to help Darryl with either drawings or experience with this model, you can contact him through the AME office ... Ed.)*

## Surface plates

Sir,

May I correct Steve Reeves recommendation for surface plates in Australian Model Engineering, Jan-Feb 1999, page 37.

The Australian Standard for surface plates requires them to have a minimum thickness in relation to their face dimensions. For the size he quotes, 300 x 700mm, it would be 100mm thick. There are two good reasons for this, (a) to resist deflection in bending when the workpiece is put on the plate, and (b), to resist warping due to torsion in the plate. This is the reason surface plates are usually supported in only three spots.

His 15mm thick sheet of glass will

bend to follow the support beneath it, ie, usually a wooden bench top. You can bend the piece of glass with one finger when it is spanning over say 450mm.

His marble sheet 15mm thick is too soft for the service and will wear "out of flat" rapidly. If the marble sheet has been polished by the average "grano" worker it will be anything but flat when supplied new.

Industry uses both pink and black granite surface plates since they do not rust. But for a person setting up a workshop, try and get a second hand cast iron surface plate from industry. Have it ground by somebody with a large surface grinder in good condition. Alternatively, if you can get access to another surface plate, as large or larger in good condition, then hand scrape your second hand plate to "as new" condition.

There is an excellent article on the art of scraping in the book *Machine Tool Reconditioning and Applications of Hand Scraping* by Edward F Connelly, published by Machine Tool Publications, Suite S 179, 1821 University Ave, St Paul, Minnesota, 55104 USA. In Western Australia it is available from the Alexander Library, Perth.

Graham Ockleshaw  
Western Australia

## Washington 4-4-0

Sir,

I have just completed a 5" gauge early American engine, a 4-4-0 called *Washington*, by AJ Reeves.

I would be interested in hearing from anyone who is attempting this engine or anyone who has completed one and has it up and running. David Piddington from A J Reeves seems (unable) to tell me how successful the engine is in Australia.

Maurice Rachow  
New South Wales

## Letterbox Contributions

You are welcome to send letters by mail to:

PO Box 21, Higgins, ACT, 2615 or  
fax to: (02) 6254 1641 or  
e-mail to: [ame@dynamite.com.au](mailto:ame@dynamite.com.au)

As far as possible, AME is an open forum for all members of our hobby. Therefore, all expressions of fact or opinion — as long as they are not libelous — will be considered for publication.

Please **type or clearly print** your letters, as script is often difficult to interpret. Due to popularity of Letter Box and limited space, letters of **400 words or less** will have a better chance of being published.

# News Desk



with David Proctor

Hello and welcome to a new era for HAME. This issue is the first to be printed by our new printers and it is the first to be totally prepared electronically. There should be a marked improvement in quality, particularly in the area of photographic reproduction. You may also have noticed some other changes in the appearance like an increase to 68 pages and more colour.

## We got that wrong

With reference to the article *A Special Day on the Mackenzie Line* (Jan-Feb), photo 6 shows Terry Philip on his BB18<sup>1/4</sup>. This loco was built from QR drawings (some 250 sheets) by Terry and his friend Eddie Cooper, who also has a BB18<sup>1/4</sup>, and is not a Mackenzie design, as stated. (Whilst Neil Mackenzie has produced several QR steam designs, the BB18<sup>1/4</sup> is not one of them.) The loco is all fabricated, the only castings being the wheels (from Eddie's patterns) and took nearly five years to build. If you watch out, you may see an article on the loco in a future issue!

Still in the last issue, on page 45, (Melbourne M E Exhibition), Doug Baxter's 4" Ransom, Sims & Jeffries traction engine was incorrectly credited to a Doug Black. Doug Baxter also noted that I omitted to mention the exhibition was at Monash University, Clayton.

A bit further back, in the July-Aug 1998 issue, an error crept into Ted Crawford's article Making a No 2 Morse Taper. At the end of the first paragraph in the centre column, the figure ".006" should be 0.06 thou (.00006"). Makes a big difference to a Morse Taper. Apologies for any inconvenience caused.

## A safety note

Two readers have drawn my attention to two photos in Steve Reeves' article on setting up a workshop for beginners (Jan-Feb). Photo 10 shows a chisel on which the head has mushroomed over. This would be potentially dangerous, and any mushrooming should immediately be dressed back to a chamfer. Photo 18 shows what appear to be two split handles on files, which could also be very nasty should a tang end up in your hand. It is good to see

our readers are alert and I am sure Steve would be the first to agree on the safety aspect. The photos were merely used to illustrate the type of tools being referred to in the text, but point taken.

## Trade and commercial

**Hare & Forbes** Annual 4-Day Sales are here again. The Brisbane sale will be held from Thursday 4 to Sunday 7 March and the Sydney sale will be from Thursday 13 to Sunday 16 May. On display will be a huge range of workshop machinery and machine tools as well as demonstrations of the new range of HAFCO CNC Lathe and Milling Machines. Other demonstrations include woodturning, grinding, tool sharpening, MIG welding, metal cutting and machining. Technical reps from a number of manufacturers will be on hand all weekend to answer your questions. The local Rotary Club will be operating a BBQ. Trade and public are invited to attend. Entry is free and big discounts will be on offer.

Wayne Roberts of **Model Engineering Supplies** advises that he now has an internet site

<http://www.mesupplies.com.au>

as well as an email address — [wayne@mesupplies.com.au](mailto:wayne@mesupplies.com.au)

This means it is easier to contact him and his up to date price list can be downloaded from the internet site.

A letter from **Stuart Models** in the UK, advises that they now supply fully machined kits and finished engines. This move has come as the result of increasing requests from many people who are not able, or do not have the time to do all the machining themselves. The kits are fully machined to the extent that the builder can complete the model with only a set of spanners, files and a paint brush. The finished models are hand built and painted to the high standard Stuart have become known for, and each model is tested and "run in" on compressed air. The range so far includes the Stuart S50, 10V, 10H, D10, Score, Beam, Half Beam, Victoria, Twin Victoria and James Coombes models.

**AME Retail** advise they still have some stocks of the video, *Steam and Diesel Railway Review* for only \$44.95 (incl

postage). If you want one of these excellent videos order now.

## Late news

SLSV (Moorabbin) have advised that their Kindred Societies run which was to be held on May 15 and 16 has had to be altered to May 22 and 23, one week later. See *Coming Events* for details

## Help

I have received a request from a reader looking for a model boat club in the Melbourne metropolitan area. Please advise me and you could also email the reader at: [Glenn.Eaton@jeack.com.au](mailto:Glenn.Eaton@jeack.com.au)

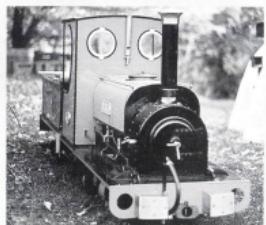
## Stolen Locomotives

The following information has come from two members of the 7 1/4 Gauge society in the UK. In June and July last year, two locomotives were stolen and it is believed they could have found their way overseas, even to Australia. Details of each of the locos follow. A reward of \$1300 is offered for information which could lead to the recovery of each locomotive and the conviction of the UK people involved in the thefts.

Should anyone see or know the whereabouts of either of these locomotives, contact Paul Booth, Caldewell, Stoulton, Worcestershire WR7 4RL, England. Phone/fax: (0) 1905 840894 or email: [Paul@caldewell.demon.co.uk](mailto:Paul@caldewell.demon.co.uk)



1/3 scale *Romulus* 0-4-0, 4-wheel tender. 1200mm long, 900mm high. Maroon and black. *ELIDIR* nameplates and *Avonside Engine Co. 2071 1933* builder's plates. Distinguished by *Buffalo* adjustable injectors, wheels marked *Minimum Gauge Railways* and single water gauge stamped *G. Oughton*.



Same scale, size and colour Hunslet slate quarry 0-4-0, stolen minus tender. Identifying features include: *ALICE* nameplates and Hunslet Engine Company, Leeds 678/1898 replica builders plates, copper saddle tank, stainless smokebox (painted black) mech. lubricator between frames (not connected), 2 brass displacement lubs, either side of smokebox, vacuum and steam brakes.

# Product Reviews



## Building the B6-3 Colonial-Type Boiler



A set of construction notes  
by  
Ernest Winter

Copyright 1988

## Building the B6-3 Colonial-Boiler

A set of construction notes by Ernest Winter

Published by E & J Winter

A4 soft cover, 32 pages includes 12 pages of drawings. Quality matt paper.

The B-6 Boiler was designed back in the 1950s by O Burnaby Bolton, as an efficient but simple steam supplier for the smaller engines covered in his range of plans and castings. It is of the Smithies layout based on the Colonial type of boiler which saw widespread use throughout Australia.

In this well laid out book, Ernest Winter begins with a history of the model and some background to the prototype, and then progresses on to the tools and equipment required to build the model. He clearly has catered for the raw beginner but hits the mark for the more experienced builder as well.

The construction steps are in a logical progression, aimed to make the task as simple as possible. The well-detailed and easy-to-read style of writing are a real plus, as are the very clear full page drawings which detail every stage of the project. The text takes the builder steadily through each stage of building, describing what to do, step by step. One feature I particularly like is that in describing what to do, the author

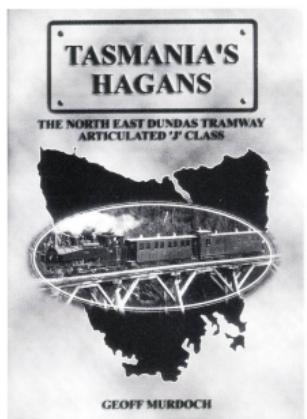
also gives the reasons why and talks about how materials behave, an example being silver solder, and how it flows, how to make it do what you want and how its melting properties alter after it has been melted for the first time. For the inexperienced, this is invaluable (not bad for me either). The boiler is followed to its conclusion and the final section is devoted to raising steam for the first time.

This is a very thorough book, easy to follow, with a very useful table of contents at the front and a basic, but adequate, index at the back. Whilst it is devoted to the building of a specific boiler, much of the information contained therein could be applied to many other models. Highly recommended.

**Price:** \$18.00 plus post (\$4.30 in Aust)

**Available from:** E & J Winter, PO Box 124, Medowie NSW 2318

*David Proctor*



## Tasmania's Hagans

The North-East Dundas Tramway  
Articulated 'J' Class

by Geoff Murdoch (Self-Published)

A4 soft cover; 72 pages of good quality semi-matt paper. Monochrome photographs.

Tucked away in the depths of Tasmania's rain-drenched west coast were several narrow gauge railways. Arguably

the most well-known of these was the Tasmanian Government Railway's (TGR) North East Dundas (NED) tramway. This line had a number of unique features including magnificent scenery and a curved timber bridge crossing the ravine in front of Montezuma Falls (which would equal Queensland's Kuranda line feature). But perhaps the most unique attraction was the diverse range of motive power. Not content with 4-coupled Krauss (1st 'H' class) or Sharp, Stewart (1st 'G' class) tank locos, TGR were either brave or desperate enough to selected two markedly different forms of articulation for their next two designs. One of these, the solitary 'J' class, is the subject of the book.

Published information on any of Tasmania's railways is rare: a comprehensive review of any of the loco designs is even scarcer. Author Geoff Murdoch is to be congratulated, not only for tackling such an obscure subject but also for the quality of the publication. Describing his long-time fascination with the book's subject as "bordering on obsession", I would agree that one must have this degree of motivation to undertake the lengthy research and writing. However, not content with that, Geoff has also built a 3 1/2" gauge model of the loco, and is now preparing to repeat the task in 5" gauge!

The layout of the book is well thought out: the scene is initially set with a description, photographs and gradient diagram of the line - necessary to appreciate why articulated designs were considered worthy of trial. This is accompanied by a map of region.

The story then moves to a biography of Christian Hagans (pronounced 'HARgans') and his contribution to the fields of engineering in general, and locomotives, in particular. Another of the book's strong points, much of this has been sourced from Hagans' grandson, Dr. Friedrich Hagans (Eng.) and this 'insider' information, (in text, diagrammatic or photographic form) lays a strong foundation for the rest of the work.

Not content with constructing successful if small conventional locomotives, Christian Hagans developed his 'Swivel Frame' form of articulation. This was applied to locomotives in a variety of sizes and gauges and subsequently licensed to other builders also. In the southern hemisphere, little is known of this form of articulated locomotive as virtually all stayed north of the equator, principally in Europe. The one that did stray south was builder's number 436 of 1900 which became known as TGR 'J1' - *Hagans Patent*.

The story now concentrates on 'J1': from the genesis of the order, through design, construction, delivery and trials. That such a range of subject matter is briefly covered in just over two pages is

somewhat disappointing but understandable. This is the 'achilles heel' of the book. As author Murdoch says in his preface; in a landscape where cameras were rare, historians and reporters were also exceedingly thin on the ground. JT and the other NED locos worked in comparative isolation for the bulk of their lives. The scattered locations and poor archival referencing of any surviving official TGR records has also hindered research.

It is to the author's credit that the following technical section does much to make up for the lack of specific history. Through a combination of crisp, clear diagrams and fairly concise text, the mechanical complexities of *Hagans Patent* is carefully unravelled and explained. The story then moves through a description of the various components and systems that make up the locomotive. In most cases, readers are referred to relevant diagrams, many of which, unfortunately, lack comprehensive captions that would avoid having to search the text for pertinent information.

However, this is counter-pointed by the lack of contemporary information covering day-to-day history of the locomotive. The world's first Garratt locomotives were also in operation on the line and debate has continued about the relative success or otherwise of Hagans versus Garratt. Which loco did the best work in the local conditions? Which design was mechanically superior? Anybody looking for a clearly documented decision as to which was the winner will not find one here.

Overall, the book presents well; most of the photographs are clear, even if some are reproduced smaller than they should be. The author has put a great deal of work into the drawings that visually explain the mechanical complexities. There is a long list of Acknowledgments that reflects the extent of the research. Also, Contents, Illustrations and Photographs are listed in the front whilst the Bibliography is towards the back after a list of relevant mechanical drawings that have been located and a Hagans Patent building list.

I have only three criticisms of the book:

Firstly: if the book goes to reprint (which it deserves), the layout should be tidied whilst the size and the placement of illustrations and photographs can be improved.

Secondly: the ad-hoc mixing of imperial and metric measurements within the text may well irritate many readers.

Finally: the author's description of the vacuum brake system on page 36 is, I feel, inaccurate. The 51mm dia. pipe is not the ejector itself; rather, it is the ejector exhaust pipe - the ejector and vacuum brake handle being in the right hand side of the cab.

The brake ejector is visible in the cab in the photo on page 35. The automatic vacuum brake system was in widespread use on the TGR and contrary to the author's speculation on page 37, meant that sufficient vacuum (for stopping power) had to be created to release the brakes before the train could move.

This book is more a technical treatise rather than a comprehensive history but will appeal to two groups. Firstly, it is an obligatory text for any student of Tasmanian locomotive history (not that there are many of us, unfortunately...). Secondly, any model engineer who is looking for, or who is attracted to something different, will find rich pickings within the pages. Basically, value for money!

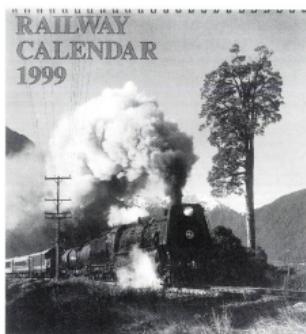
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*Melanie Dennis*



#### Railway Desk Calendar 1999

#### NZ Railway & Locomotive Society

The New Zealand Railway & Locomotive Society have again produced an excellent desk calendar. The calendar is somewhat larger than one normally expects desk calendars to be with its pages measuring 210mm x 230mm high. The cover scene is a dramatic photo of preserved Ka class locomotive 942, in the original semi-streamlined guise of these locomotives, heading a passenger train beneath the snow-clad Southern Alps on what has become known as the Trans Alpine route between Greymouth and Christchurch. Each month has a separate page with its own a photo, these being a mixture of past and modern diesels (5 pages), steam scenes, past and present (5 pages), a photo of one of Wellington's trams emerging from Hataitai tram tunnel

in 1962 and the final operation of electric locos through the Otira Tunnel under the Southern Alps.

The Calendar part is very easy to read as it is uncluttered with fairly large numbers. The format is wire-bound with flip-over pages. A map of New Zealand showing the location of each of the photos is displayed on the back of the calendar.

#### NZR&LS Railway Calendar 1999

**Price:** NZ\$11.00 (include postage)  
**Available from:** The New Zealand Railway & Locomotive Society Inc, PO Box 5134, Wellington, New Zealand.

*David Proctor*

#### AME Retail

*Just received from South Africa . . .*

#### The Shimmer of Steel

available as book and video for \$104.95 or a book only for \$64.95.

*(Prices are posted Australia wide.)*

The video is not available separately as it parallels the book, giving motion to the still shots in the book. It runs for 105 mins and follows the book throughout. Picture quality is excellent though sound is a little soft at times.

The book is the work of Dennis Moore, an enthusiast who set out to record some of the last revenue steam workings on the South African railways. The period covered is 1990 to 1998 and feature some spectacular shots in spectacular locations at times when only the most dedicated are out. Not to be missed!

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## Classifieds

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- Live Steam magazines in sets of one year at a time from 1971 to 1991. POA.
- Model Engineer mags in a set one year for 1978. POA. Rod (08) 8536 2489

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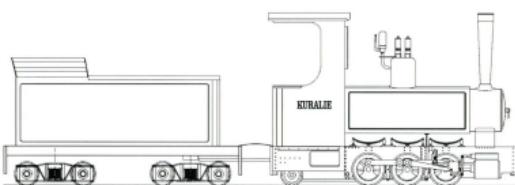
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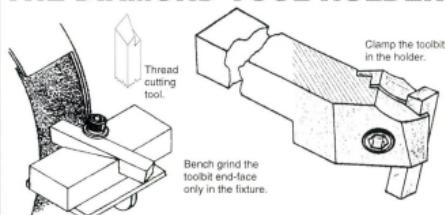
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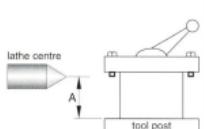
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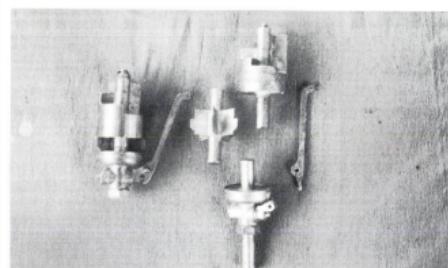
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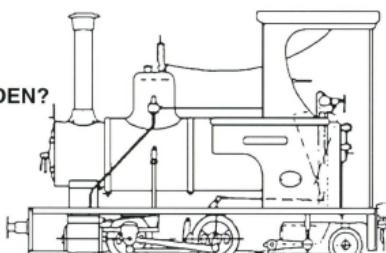
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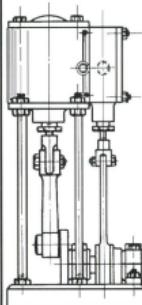
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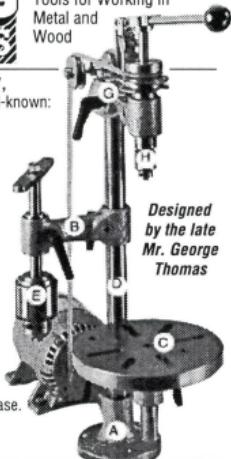
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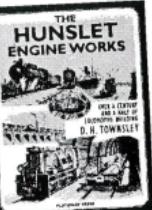


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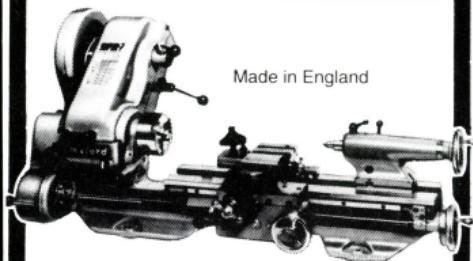


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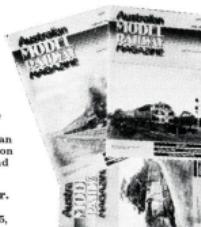
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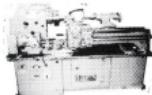
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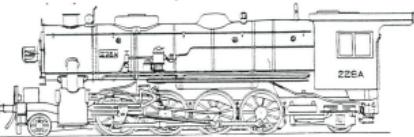
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